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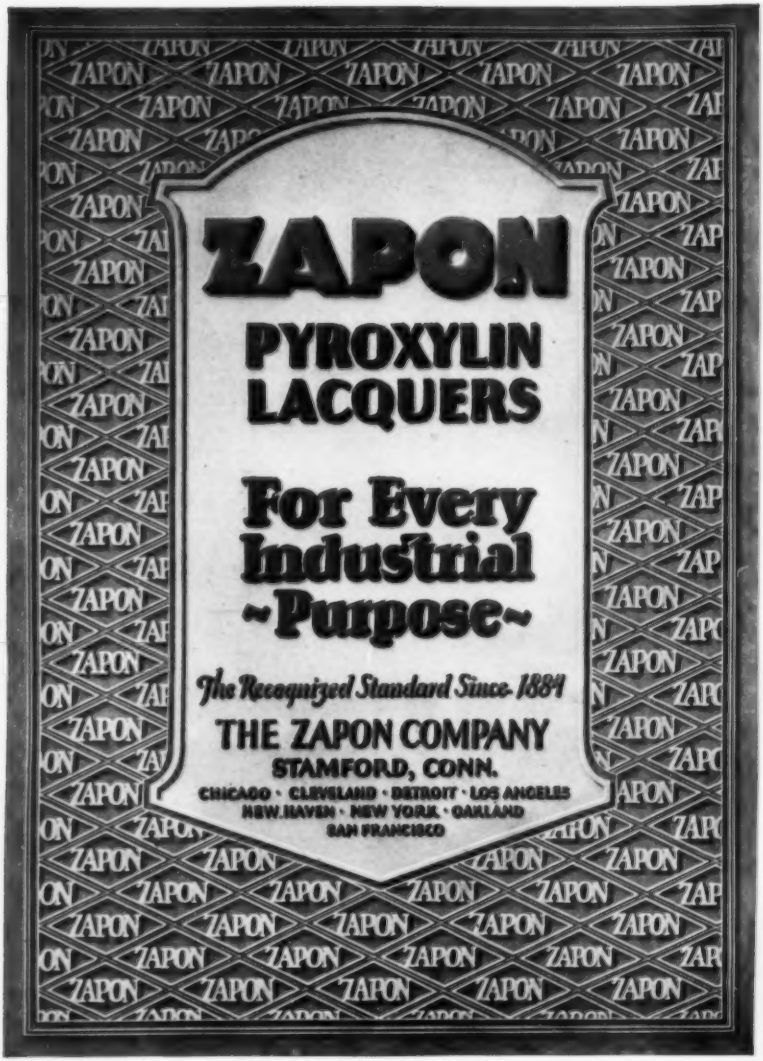
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Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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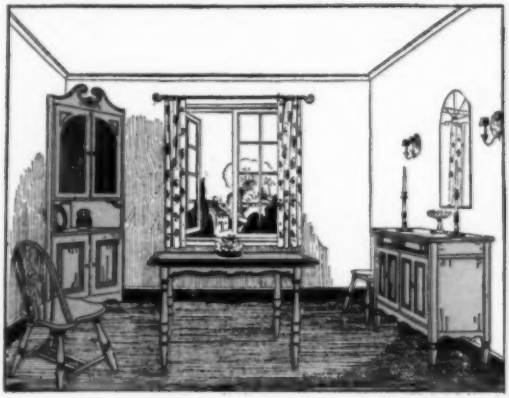

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With the Editor

MANY of our friends are amazed at the remarkable growth and enviable prestige attained by INDUSTRIAL FINISHING in such a short period of time. Some reasons are aptly stated in a recent letter from one of our readers, Mr. A. F. Eibell, who writes:

"You must know I am proud to see that INDUSTRIAL FINISHING is still growing, but having been one of the charter members so to speak, I should not be surprised, for it's a clean business sheet—gives the employer and employee what they need—diversified information in compact form. It gives the advertiser his money's worth, for it reaches the fellow who uses the goods himself; the advertising doesn't have to seep through the finish-user's customers to him, as some of the more expensive ads do. I hope that INDUSTRIAL FINISHING may keep on growing to the end that those of us who are getting old in years may be able to keep young in the trade by knowledge and use of the latest improvements in material, methods and appliances."

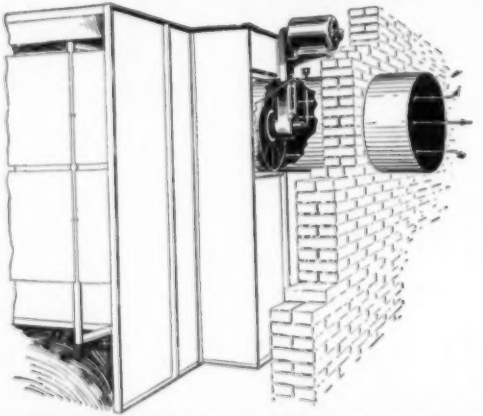
We are striving to continue the high standards which have helped to place INDUSTRIAL FINISHING where it is today, and we welcome suggestions that will contribute further toward making INDUSTRIAL FINISHING the ideal journal for all users of industrial finishes. We feel sure that INDUSTRIAL FINISHING will continue to grow as more individuals and concerns become familiar with the service it is rendering to the important industries it serves.

W. H. Rohr

Managing Editor

What it means to you

to use DeVilbiss spray-finishing equipment



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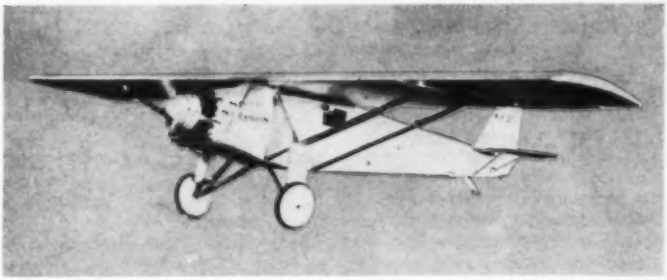

The Finishing of Modern Aircraft

Lacquer expert and authority tells what materials, colors and schedules are used in finishing the various parts of the modern airplane

By S. P. Wilson

THE INCREASED interest in aviation that has followed the epoch-making flights of Lindbergh and Chamberlain is certain to make the manufacture, finishing and refinishing of airplanes of steadily greater importance. Although aircraft will probably never equal the automobile as a consumer of finishing materials, it will unquestionably become a field of first importance, particularly since not only the appearance, but the flying qualities of an airplane depend in large measure on the materials and schedule employed.

Lacquer Tightens Fabric Wings

Most airplanes have fabric wings—either cotton or linen—although some metal planes are produced. The tautening of this fabric is probably the most important application of finishing material, and is accomplished almost exclusively by the use of pyroxylin lacquers. In fact, it was the experience gained with lacquers as airplane dopes, during the war, that led in large measure to the enormous expansion of the pyroxylin lacquer industry since.

One of the notable properties of pyroxylin solutions is that of contracting and tightening as the solution dries. While this is undesirable in many places and must be counteracted by suitable resins and plasticisers, it is of chief value on airplane fabrics.

Many airplane makers use a first and often a last coat of cellulose acetate lacquer, instead of the nitrate or ordinary pyroxylin lacquer. This is done because the former material is non-inflammable. Fairly thorough tests

NOTE: The picture above will be easily recognized as the "Spirit of St. Louis" in which Col. Chas. Lindbergh flew from New York City to Paris; time 33 hours, 31 minutes.

have been made, however, and it is the writer's belief—and that of many others—that unless the film is all cellulose acetate, it might just as well be all nitrate. An all-acetate film, besides being very expensive, is deficient in tautness, so a film of the nitrate may be considered the basis of the standard airplane practice.

The pyroxylin found most suitable is that of high viscosity, this giving the most tautening effect per unit weight of film. It must be borne in mind that every ounce of weight that can be saved in airplane construction is of advantage. Since pyroxylin is of high viscosity, only a few ounces can be carried in a gallon of solvent and several coats must be used.

The material is generally too thick to spray, therefore it is usually brushed on by hand, although it is understood that some makers have managed to get good results by spraying with specially constructed equipment. One bad result of spraying is the raising and stiffening of the cloth fibers, this giving a rough surface which increases air resistance and friction.

Predominating Colors

Since clear lacquer is attacked by sunlight, pigment is incorporated into at least some of the coats. The chief pigment is aluminum powder, chosen because of its lightness, its coverage, and its resistance to the elements. Where other colors are desired, as in upper wing surfaces, insignia, etc., colors of maximum strength and minimum weight are used. Yellow and khaki predominate, with red, white and blue insignia on government aircraft.

A typical finishing schedule consists in brushing on one coat of a 6-oz. acetate dope, three coats of a clear 6-oz. nitrate dope, and two coats of nitrate dope containing between 8 and 12-oz. of aluminum powder per gallon. A high grade spar varnish containing the aluminum powder may be substituted for the last two coats of nitrate dope.

If an all-lacquer schedule is used, a coat or two of spar varnish is sometimes given so as to secure a smoother surface that will not pick up dirt quite as quickly. The finished fabric should have approximately 3½ to 4-oz. of material per square yard, or about one ounce per square yard per coat.

Fuselage; Struts; Propellers

The body or fuselage of the plane presents no problem essentially different from those encountered in automobile body finishing, except that they are generally made of duralumin or similar light aluminum alloy which requires a particularly adhesive priming coat. Lacquer finishes are usually given, either in aluminum or colors.

Wooden parts are generally of selected spruce, and while often left unfinished it is better to give them a protective coat of spar varnish containing aluminum powder or gray pigments. Propellers are made of laminated wood glued with specially devised water-resisting material, usually of the casein glue type. These are naturally very carefully made, sanded and rubbed to almost mirror smoothness and are best finished by using the highest grade spar varnish. The metal parts, generally made of aluminum or duralumin, are usually protected from corrosion by a coat of spar varnish mixed with aluminum powder.

Finishing Balloon Fabrics

Balloons present quite a different problem, of course. The need for finishing material there is primarily to reduce the leakage of gas through the rubberized fabric, as well as to protect it from the weather. A very flexible varnish is used for the purpose, similar to that used on raincoats.

Aluminum powder is used largely for both its ornamental and protective qualities, and here its power for reflecting heat rays away from the gas bag is of great importance. The balloons are generally made with one gas bag inside of an outer casing; the inside of the outer casing, and the outside of the inner casing are usually finished with 3 to 4 coats of cellulose acetate dope, with or without aluminum bronze.

Factory Cost Estimates

One of the strongest arguments advanced by the factory's production workers is, "how is it that our company does not make money on such and such a job when they get so much for it, and the labor and material only cost a fraction of the amount charged?" The various factors entering into the ultimate cost of a product are far more numerous than the average worker realizes, and the various charges of burden and overhead are only part of the additional costs.

It is on jobs that estimates have been given, that the writer finds the greatest fault. Too often the estimate furnished by the foreman finisher is a guess, and when the job is given his department, he makes every effort to hold to his estimate, with the result that any discrepancy is usually charged to some other work. Generally, there is a department repair number, and it has been proved time and time again that any excess time or material will often find its way to this charge, rather than face the complaint about too high a cost.

The finishing department of any manufacturing organization is one of the most important, if not the most important position in the entire unit, because a poor finish will spoil the finest cabinet work, while ordinary cabinet work is often made to appear as the finest work due to the skill and workmanship of men in the finishing room. In those cases where the original estimate has gone wrong, no attempt should be made to cover the mistake, but a careful record should be kept to prevent repetition of a similar occurrence. It is the co-operation of each and every member of the organization that puts it across, and no one department or person can claim full responsibility.—E. F. Werner.

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—John A. Twamley, c/o Stalker Sash & Door Co., Rochester, N. Y.

How modern materials and equipment helped

Decorative Stenciling with Spray Equipment

Describing the modern production equipment and accessories used by a large furniture manufacturer for applying decorative designs in color, with stencils and spray guns

By F. W. Worthington

A NUMBER of furniture manufacturers are now employing the spray finishing system in connection with stencils to simplify and speed up the application of one, two and three-color decorative designs. Lacquer enamels are generally employed for this service because of their quick-drying characteristics.

In one factory where this kind of work is put through on an economical production basis, the equipment illustrated in the accompanying pictures has been installed according to specifications based upon knowledge acquired after considerable experimenting had been carried on with crude apparatus developed at the plant.

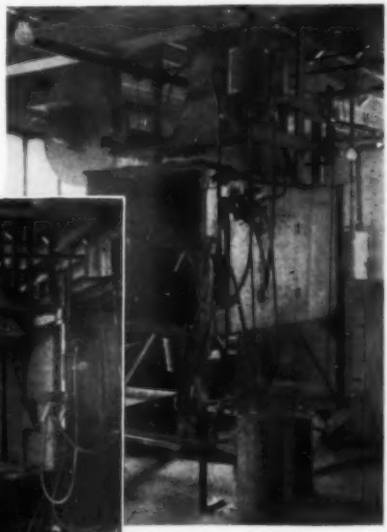
The size of the parts to be decorated and the means of applying decorative materials were factors which governed the design and size of the double booth pictured in Figs. 1 and 2. Paneled kitchen cabinet doors, varnish finished in natural light oak and enamel finished in light colors, were the chief parts to be decorated.

It was decided to place the surface to be decorated at the top of the booth, positioning it so the operator could direct his spray upward. Accordingly, the top of each booth was made in the form of a framed opening and the standardized, interchangeable, stencil-plate holders are made large enough and strong enough to completely cover this framed opening. The two sides of a typical stencil-plate holder, with stencil plate in position, appear in Fig. 3.

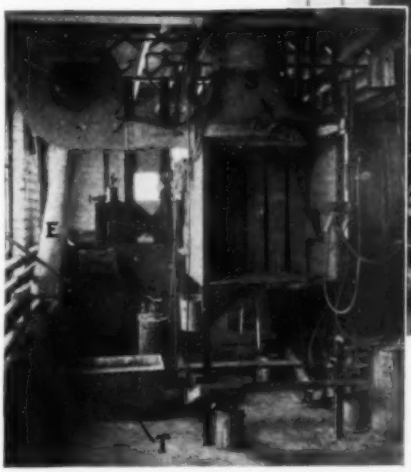
When the plate is in position at the top of the booth, it slopes down slightly toward the back, to make the spraying easier for the operator. The face marked *A* in Fig. 3 is at the top and is arranged to receive the surface to be stenciled; it has stop guides at the edges and a raised section in the center to which the thin-steel stencil plate is attached. The raised section makes flat contact with the sunken panel to be decorated.

The under side *B*, Fig. 3, is practically plain, with the deeply-recessed stencil hole beveled around the edges to make the edges of the stencil plate more easily reached with the spray gun. These stencil-plate holders are made of plywood about 1-in. in thickness, as it is important that they stay perfectly flat.

The paneled door, or whatever article is to be decorated, is placed flat on top of the booth and when properly positioned against the guides, it is pressed down firmly against the stencil by a pressure pad which is operated



Below: Fig. 1—Notice the baffle-plate back of spray booth, the directly-motored exhaust fan, the pressure pad *S*, the vessel of lacquer thinner *T*, the exhaust pipe *E*, and the several small pressure containers for colored lacquer-enamels.



Above: Fig. 2—Another view of the double spray booth, showing the arrangement of levers for operating the pressure pad marked *S* in Fig. 1.

by pressure on the foot bar at the front of the booth. Release of foot pressure allows the pressure-pad levers to spring back in "open" position.

To make the pressure pad, four rubber rings such as are used on an endless-bed sander, were attached to a small wood plate marked *S* in Fig. 1. The operator holds one foot on the footbar as he sprays lacquer enamel through the opening of the decorative stencil.

As spraying through the stencil proceeds, the edges of the stencil become coated after a time and must be cleaned. This cleaning of stencils is done with lacquer thinner in the vessel marked *T* in Fig. 1. Fumes from the cleaning liquid are removed by suction pipe *E*, Fig. 1, which enters the overhead fan that produces exhaust suction draft through the baffle-plate backs of the double booth. This equipment is giving entire satisfaction for stencil spraying operations, and it is also useful for the overall spraying of small articles.

Close inspection of the floor in Figs. 1 and 2 reveals a number of small size containers, in addition to the larger one in the left foreground. These are home-made containers for holding the several different colored lacquer

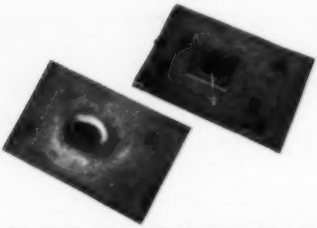


Fig. 3—The top (A) and bottom (B) sides of a typical stencil-plate holder which also serves as a removable top for the small spray booth.

enamels used in this decorative stenciling. Each small container is made of a section of large-size steel pipe capped on both ends in the regular way. In each case the cap which serves as the top is bored and tapped for hose connections.

Cause and Prevention of Poor Sanding

Sometimes, in furniture factories, one sees improperly sanded surfaces which show roughed-up places, scratches and a general poor finish. Usually this is because work sent into the finishing room for the final coat, arrives improperly cleaned and dusted and without a thorough inspection.

The roughed-up places are often caused by the sanding operator placing his idle hand on a portion of the sanded surface for too long a period; the heat and pressure from his hand causes the sand dust to imbed itself into the varnish on the article being sanded.

Some workmen's hands are always damp and will produce, on the sanded surface, spots which are almost impossible to remove. These spots are magnified as the work receives the final coat of varnish or lacquer. The workman's idle hand should be kept off the finished surface as much as possible.

Scratches in the sanded surface are generally caused by the use of too coarse a sandpaper, by not dampening the paper properly, or by failing to clean off the excess dust as one goes along, thereby causing small particles of sand dust to get under the paper; this scratches and burns into the surface being sanded. Once the work is burned or scratched in this manner, it is very difficult to rid the surface of all trace of such damage.

Workmen in the sanding department should be taught thoroughly the correct methods of sanding; they should be made to realize to the fullest extent the trouble and loss that is caused by doing the work improperly.

It is important to use sandpaper correct between the preliminary finishing coats.

Some firms are using various size sanding blocks, the results obtained varying. But, in the writer's opinion, best results are obtained by sanding without the block—using the proper grade of sandpaper (No. 4/0 for all final sanding coats) and with the paper properly dampened.

There will be less scratching and burning of the surfaces because the hand is more flexible than the block. It gives better results on either large or small surfaces, unless the smaller surfaces are turned or have raised or beveled designs; then steel wool is the proper article to use for the best sanding results in the finishing room.—J. H. S.

Foreman Finisher Responsibilities

The foreman finisher in a woodworking factory is held responsible for the proper use and matching of all colors used, as well as the proper filling, the various undercoats needed and the final finish coats. He must have a thorough knowledge of all this and be able to test all materials used, to find out whether they come up to the qualifications desired.

All stain anilines must be carefully tested as to their proper strength. If this is neglected and the aniline happens to be weaker than the previous batch, the job will be off color and serious trouble will follow. Filler must be properly mixed and applied to fill all pores thoroughly.

The foreman must see that the filler does not contain too much oil, as this would retard the drying, cause shrinkage and probably lead to the appearance of those troublesome pin holes. A foreman finisher must find out what time is required to thoroughly dry his various undercoats and final coats, and then adopt a time schedule accordingly.

Keeping all equipment in proper shape and in repair is very essential. The air compressor, spray equipment and rubbing machines should always be in good running order, for if any of these are idle the finishing department is seriously affected; in fact, operations are at a standstill until they are repaired.

Foreman of all departments have their share of shop troubles, but owing to the fact that the foreman finisher must not only remedy the mistakes of his own department but also the accumulated mistakes of certain other departments, he probably gets more than his share of troubles and responsibility.

In the past, the foreman finisher was given little credit or consideration, but today the importance of the finish, and the fact that the finish sells the article, has brought him full recognition by all progressive firms.—John H. Hamilton.

Furniture Enamels Booklet

The Glidden Co. of Cleveland, Ohio, have published an attractive 36 page booklet on the subject of "Furniture Enamels" which describes in complete detail seven different methods of producing colored finishes on furniture, including paint and varnish materials, as well as nitro-cellulose lacquers.

This booklet also contains a color card of 32 popular colors which are obtainable in egg-shell enamels, gloss enamels, japan colors, or nitro-cellulose lacquers. It not only describes the company's products, but gives a wealth of general information about the subject of finishing furniture in colors. A copy of the booklet will be sent free of charge to any furniture manufacturer.

Wise Selection—
Satisfactory Results

Lacquers to Suit Your Needs—I

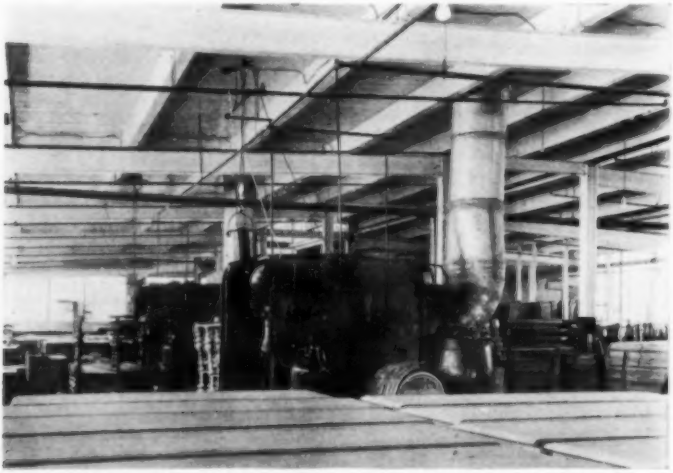
President of Pyroxylin Products, Inc., explains practical facts about the composition of lacquers, and points out the importance of selecting lacquer to suit one's own particular requirements

By W. Courtney Wilson

THIS article is written with the idea in mind that pyroxylin lacquers and enamels have found a permanent place among the high grade finishing materials. In order that they hold this place, it is desirable that the user of this type of finish have sufficient knowledge of pyroxylin lacquers to enable him to purchase a grade that is best suited to his needs.

Lacquers in general have often been blamed for the failure to obtain the results desired, whereas the failure was mostly due to the use of the wrong type of lacquer. In many instances where pyroxylin lacquers have failed to give the desired finish, it has been thought that lacquers in general were unsuited for the purpose, whereas, the failure was not due to lacquers in general, but rather to the use of a type of lacquer designed for entirely different results.

This does not imply that lacquers will in all cases replace paints and varnishes, for un-



View in finishing room of a new dining-room furniture factory where lacquer finishes are used exclusively.

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doubtedly paints and varnishes will continue to give certain desirable characteristic finishes more economically than similar finishes can be obtained through the use of pyroxylin lacquers. The lacquer user should know therefore, what is required in a lacquer in order that it will meet his requirements in the matter of appearance, durability, and ease of application.

Composition of Lacquers

The ingredients of pyroxylin lacquers may be divided into two main divisions, namely:

1—Non-volatile materials, or the materials that make up the coating after the finish is dry.

2—The volatile materials, which are the liquid solvents used for holding the non volatile solids in solution.

The non volatile materials consist of:

1—Pyroxylin or nitrocellulose. 2—Gum or resin. 3—Plasticiser. These three materials constitute the film remaining on the finished article, and are, therefore, of utmost importance. These, after all, are the essential materials which the finishing man purchases, and he buys the volatile solvents in order to obtain a liquid material rather than a solid one.

The pyroxylin or nitrocellulose, if used alone, would be too tough and hard to give a finish that would be workable. Furthermore, about one pound of pyroxylin per gallon of lacquer is the maximum that can be used and still have a material thin enough to spray with most spraying equipment. This would mean that the coating obtained would be so thin, that a large number of coats would have to be applied in order to build up a "body."

While pyroxylins of lower viscosity are obtainable, it is at a sacrifice of some of its strength and durability. Pure pyroxylin has poor adherence, and, if used without plasticiser, is likely to be too brittle.

In order, therefore, to increase the amount of actual solids per gallon, or, in other words to increase the amount of material remaining on the surface of the finished article, a resin is added. The resin plays other parts, however, and may either increase or decrease the gloss according to the type of resin used. Another important function of the resin, is to increase the adherence.

A lacquer made entirely of pyroxylin and gum or resin, in turn, would be entirely too brittle, and would have a tendency to scratch, white, chip and check. In order, therefore, to give a more flexible and a tougher film, a plasticiser such as dibutyl or diamyl phthalate, tricesyl phosphate or castor oil is used.

The volatile constituents consist of various organic pyroxylin solvents such as esters and ketones, and resin solvents, or diluents such as alcohols and hydrocarbons. These are entirely lost through evaporation during drying. It is most economical, therefore, to obtain the highest amount of solids possible at a viscosity (or degree of fluidity) which is consistent with ease of application.

As to the pyroxylin itself, there are several sources. The highest grade for lacquer use is new nitrocellulose, and this should usually be insisted upon. Lacquers made from scrap celluloid or powder dope almost always

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Murphy Kauriol Wood Preparation stains, fills and seals wood in one operation. Being, itself, of a pyroxylin nature, it makes an ideal undercoat for lacquer, although it may equally well be used under varnish or wax.

When used under lacquer, it unites with the finishing coats to form one continuous, unbroken film of great beauty and durability.

Its use in the finishing room cuts down time, labor and the amount of storage space necessary to carry work in process of production.

Furniture and cabinet manufacturers are finding that Murphy Kauriol Wood Preparation often reduces finishing costs one-third, in addition to cutting days off their previous finishing schedule.

Write us to have one of our representatives call and demonstrate how Murphy Kauriol Wood Preparation can cut finishing costs and speed production in your finishing room.

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"The Murphy Varnish Company once told me that it was not its ambition to have the largest varnish business in the world, but to be sure that wherever the name Murphy appears upon a can of varnish, or any other finish, that name would stand for a good job faithfully done and fully delivered. If that way of doing things should lead to the largest varnish business in the world, well and good, but not on any other terms."

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crack or check in from 12 to 18 months. Only in cases where the finishing man is unconcerned about his finish at the end of the first year, should a lacquer made from scrap celluloid or powder dope be considered.

Short-Fiber Cellulose

Nitrocellulose, or pyroxylin, is made by nitrating pure cellulose. With a given purity of cellulose, the source is immaterial, that is it may be either wood cellulose or cotton cellulose.

There has grown up a belief, especially in finishing rooms, that a long fiber cotton produces a better pyroxylin than a short fiber cotton. This is, of course, absurd, since the mechanical conditions of the pure cellulose has no influence on the nitrocellulose obtained, other than in the ease of handling during nitration.

Nitration is a chemical process and pyroxylin is chemically very different from the original cellulose. The terms "long" and "short" fibered cotton have, therefore, absolutely no significance when applied to the nitrocellulose used in lacquers.

Since pyroxylin is made having a wide range of viscosity, it is possible to produce a lacquer containing only a few ounces of non-volatile material per gallon, which is so thick or viscous that it is necessary to use more than an equal volume of thinner in order to make the lacquer thin enough to spray.

As an illustration, suppose that a lacquer contains a total of 12 percent non-volatile material (a little less than 1-lb. per gallon) and this lacquer is thinned with an equal volume of thinner. The non-volatile material is reduced to 6 percent by the addition of the thinner, so that for every gallon sprayed about 8 oz. remain on the surface and over 7 lbs. evaporate into the air.

On the other hand, we might have a lacquer of identically the same composition, and the film remaining after drying would be identical with the one already mentioned, except that a nitrocellulose of lower viscosity is used.

Now suppose the second lacquer contains 22 percent non-volatile, and is at a viscosity ready for spraying. For each gallon sprayed, about 28-oz. remain on the surface. It will be apparent that three coats of the thinned lacquer will be required in order to apply the same amount of finish of the same composition to the surface. It is very apparent, therefore, that the viscosity or "thickness" or "body" of the lacquer itself should not be used as a basis for judging the amount of non-volatile material in a lacquer.

Specific Gravity

Neither will the specific gravity be an accurate index of the non-volatile material in a lacquer. While it is true that the specific gravity increases with an increase of solids, this increase may be more than offset by the gravity of the solvent and diluents used. For instance, a lacquer containing 25 percent non-volatile with solvents of low specific gravity, might have the same gravity as a lacquer containing 15 percent non-volatile with solvents of a high specific gravity.

In order to meet different requirements, a number of different types of lacquers have been developed. In order for the finisher to determine the type of lacquer best suited to his needs, he has,

Ed Smith's Page

How Much Lacquer Do You Waste in the Air?

I DON'T claim that you can overcome ALL waste in a spraying Lacquer Enamel. There must be SOME evaporization between spray gun and the job. But through our Escolac Wood Enamel, I have been proving right along that it is possible to reduce this waste by as much as 30% to 50%.

"Balance" is the important thing in a Lacquer.

Remember that the solvents in a Lacquer Enamel are the *vehicle* of the solids. Their FIRST purpose is to carry the lacquer to the surface—and to evaporate AFTERWARDS. Low-boiling solvents are supervolatile and when they are used, it is not uncommon to see as much lacquer fly into the air as goes onto the job. The result is WASTE!

Our Escolac will illustrate the point I am trying to make. Here is a Lacquer Enamel that contains exactly the right "Balance" of solids and solvents. It actually has more solids per gallon than any lacquer I know. At the same time it is made with higher boiling solvents.

What is the result?

First, the solvents actually do carry the lacquer to the surface to be finished. It evaporates AFTER it has accomplished its purpose. Loss between spray gun and the job is minimum.

Second, because it deposits a larger percentage of lacquer on the surface, it naturally has greater building properties.

A third factor is that it has greater covering capacity per gallon.

Because of these primary virtues, Smith Escolac Wood Enamel actually will produce as fine a job in two coats as is usually possible in three. This means a considerable saving both in materials and in labor. I would like to send you a typical sample panel showing the kind of finish you can produce with Smith Escolac. If you will simply write your name and address on the margin of this advertisement, I will be glad to send it to you. No obligation of course.

Ed Smith

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as a rule, "tried 'em all out" and selected from the number tried the particular grade of lacquer that seemed best suited for his purpose.

This method of selecting the lacquer is somewhat wasteful both of time and material, and in many instances proves expensive. Furthermore, the lacquer which gives the best results in shop tests may not prove to have the durability that is desired or expected. In the final installment of this article next month an attempt will therefore be made to give, in a rather broad, general way, the general factors which influence the type of finish that may be expected of a given lacquer.—Paint, Oil & Chemical Review.

Carrying the Color in Your Eye

Many times I have overheard finishers and salesmen alike using the phrase, "Oh, I can carry the color in my eye." This may seem possible to them, but I believe it is impossible. Regardless of how clever one is at matching colors, it isn't safe to rely upon "carrying the color in one's eye," that is, remembering it by sight alone.

When a color is to be matched, I always make it my business to obtain a liquid sample, if a liquid color is to be matched. If a finished sample is to be made, such as a wood or metal panel, then I inquire about the number of coats to be used; also whether or not the finish is to be baked or air-dried. Baking, you know, has a tendency to change shades. These methods have helped me to get satisfactory results.

Along this line I am reminded of the following conversation, overheard recently in a finishing department of a furniture factory, between the foreman finisher and finisher. The finisher had been out on some jollification and returned to work with a discolored eye.

Foreman Finisher: "Say, John, where did you receive that discolored optic?"

Finisher: "Oh! I am just carrying the color of the last job in my eye."—Joseph Cowan.

Denny, Hilborn & Rosenbach, Inc.

It is announced that Edward B. Dickinson, associated with Denny, Hilborn & Rosenbach, Inc., selling Dhrlac lacquers in the metropolitan area, has headquarters at 7-11 East 44th St., which is the office of Chadwick L. Rowe, Eastern Sales Director.

Aircraft Lacquer Booklet

Berry Bros. of Detroit, Mich., are distributing a small booklet entitled, "On the Wings of Progress," in which appears material dealing with modern methods and practices in aircraft finishing, along with a list of this company's aircraft finishing materials.

Grand Rapids Varnish Corp. Maintains Finishing Studio

The Grand Rapids Varnish Corporation at Grand Rapids, Michigan, announces the operation of an enlarged studio instituted to aid manufacturers of furniture and other wood products in search of new finishing effects, or faced with technical finishing difficulties. Its personnel includes a staff of furniture designers, creative decorators, and research men —all with the background which comes from close contact with the Grand Rapids furniture industry.

Shipments of furniture patterns in the white are received at the studio from manufacturers all over America, it is stated. Finishes and decorative schemes are worked out in detail, and careful specifications are prepared. The pieces, with the recommendations are then returned to the respective factories. New finishes are also worked out for out-of-date suites and odd pieces.

The Spraco
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The general demand for a tool to produce delicate high lighting and antiquing effects so much in vogue in the fine furniture trade today has met a response in the Spraco Model 15 Gun. It is also adapted for blending, shading, stippling and decorating, and can be used with cup, gravity or pressure feed.

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Ask for Bulletin 103 for additional information.

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Sanding Between Finishing Coats

Foreman of Wood Finishing and Painting at the American Fixture Co. discusses this particular phase of finishing room activity in a practical way and reveals interesting and valuable suggestions on the subject

By Edward C. H. Rottmann

ONE OF THE major problems of the wood finishing department today is proper sanding. It is not a new problem but it is more troublesome for the present day foreman finisher than in the past because, in the old days, workmen were trained as a rule through apprenticeship—more so than in the present time. In those days many of the apprentices were not advanced until they could sand properly, and this sanding was considered a vital element in successful finishing. In proof of this view I cite the carriage painting industry, where sanding was an art.

Slighted Sanding

But today, with new materials and mass production, I believe sanding is more or less slighted. Generally it is detailed to novices. Artisans in the trade, today, should realize more and more the importance of this necessary operation.

In high class work it is necessary to do good sanding for whatever is slighted in the sandpapering operation means more work and more grief on the rubbing deck, hence a good rubber is always a good sander.

The workman should apply himself closely to the work at hand. By this I mean concentration of mind, and eliminating all false economy such as using worn down sandpaper, which is practicing no economy at all, considering results. The workman should change his paper frequent-

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ly. A good snappy, steady stroke of the hand is preferable to a slow arm movement. With inexperienced help in the detailed working operations, uniformity in sanding cannot be obtained unless the men are given very close supervision.

Unequal Sanding

Let me go more deeply into this point. For instance, if the undercoats are unequally sanded and are not uniformly cut down to surface, it can mean only one thing—that the last coat of finish will be rough in spots and consequently it will test the rubber's skill to give the surface satisfactory appearance, without cutting through the finish coat, which necessitates doctoring and patching. This always results in slowing up production.

The apprentice, left to his own volition, is almost sure to become thoughtless, careless and neglectful in his work. In show case and fixture work, for example, the centers of pilasters and mouldings will receive a close sanding, while the outer edges, through fear of cutting them white, are left to take care of themselves. White edges are caused by improper use of sandpaper. The paper should not, at any time, be bent over an edge or corner when sanding.

Specific Suggestions

Avoid dragging any part of the paper over the corners or edges. Good results cannot be had from a "slap-stroke." Only one face of the edge should be sanded at a time, and the fingers should be used as a guide along the connecting edge.

This same condition applies to panels and corners near mouldings. The result of this careless sanding is responsible for much of the cutting through in the rubbing operation. A light, careful, cross sanding on the tops and bottoms of panels, etc., is permissible providing it is well sanded with the grain afterward.

The Abrasive

The proper abrasives must be used at all times. This is left to the foreman in charge, as different things are to be considered, such as the cutting quality of the paper, how dry the coat is, the material used on the surface, and whether it is high class work or not.

As an accepted standard in our line, of bank fixture finishing, we find that No. 3/0 or 4/0 garnet, double-face finishing paper for sanding varnish and lacquer, serves us well. To eliminate scratching, the paper is moistened on the back side. This custom can be elastic in a department, among good workmen as a whole, as I have seen some workmen do a beautiful job of sanding with coarser paper than mentioned above.

Sand Blocks

Regarding the sand block, personally I do not approve of it (felt or otherwise) in our line of work—other than its use in sanding the sponge coat. We find that battleship linoleum glued into a solid block, the dimensions of which are 1½x3x5-in., contains the right degree of flexibility for this purpose, and in this operation we have found it superior to any other material for sponge-coat sanding—especially so on large surfaces.

As I say, I would not advocate its use in sanding the various undercoats, because, to my knowledge, the hand sanding gives bet-

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you owe it to your business to investigate and learn of the advantages we can give you, at no increase in unit cost.

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ter results, as it does away with patching, following the use of a sanding block. Experience in our line has taught us also that crevices, mouldings, etc., can be better reached by the hand, and given a truer, more efficient sanding.

Judging by Feeling

Practical experience also will teach workmen that the feel under the paper is just as important as the vision, in the final results. and we especially consider the parts important that come in contact with the hand or eye. These are always carefully sanded by hand. Sandpaper should be cut or torn over a very sharp edge, rather than torn haphazardly. Sandpaper, carelessly torn, not only means a waste of paper, but it interferes with sanding efficiently in corners and moulded edges.

All things being equal, the foreman in charge must necessarily give close supervision if he would have his sanding done properly. Unless this is done, the foreman will find that the work, at times, will be carelessly slipped along to the final coats. Even experienced workmen (perhaps unintentionally) are sometimes guilty of slighting the sanding operation; this always slows up production.

Really, a good text book on this important subject, at anytime, would not be amiss.

New Furniture Finishing Book

To fill a recognized need for a modern reference book covering all phases of furniture finishing, Frederick J. Drake & Co., of Chicago, have published a new book written by A. B. Pattou and C. L. Vaughn.

The authors are well informed men, fortunate in having had the practical and diversified experience needed to qualify them for writing such a valuable book for the trade.

The volume of 540 pages is divided into five parts, each covering a distinctive feature in the finishing, decoration and patching of furniture. Book I, entitled "Period Furniture and Modern Styles," gives a history of furniture from Egyptian and Assyrian down to and including that of the 19th century. This book has been interestingly written, and explains circumstances influencing changes in furniture styles.

Book II deals with "Furniture Finishing," having chapters on woods, equipment for the finishing room, stains and fillers, undercoats and finishing coats, and closes with a chapter on removing varnish and refinishing.

Book III is a careful study of "Furniture Decoration." In this book the myriad details of decoration are covered in an expert manner with practical suggestions for their application.

Book IV, called "Furniture Patching," reveals the development of the art of patching, from the first crude methods to the highly efficient methods of today.

In the final book, miscellaneous and modern subjects are covered, including chapters on the finishing of turned articles, metal lamp stands, wicker and upholstered furniture, radio cabinets, refrigerators, etc.

The entire volume has been carefully prepared and is bound in a handsome and serviceable cover. All operations explained have been profusely illustrated with halftone plates and etchings, which should make it invaluable to those interested in this work.

Marietta's Missouri Salesman

Mr. Arthur Lawson, of The Marietta Paint & Color Co., will be in charge of the company's new St. Louis office, and will also have as his territory southern Illinois and the state of Missouri. Mr. Lawson is well known in St. Louis.

Paul Maehler Co. Expands

The Paul Maehler Co. announces the acquisition of improved property adjoining its factory 50x135-ft., which will be altered to be a part of their present plant at 2210-20 West Lake St., Chicago, for machine and steel shop addition. The property, when completed, all under roof, will be 150x135-ft. Present offices will also be rearranged and placed on second floor.

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PAINTS, enamels, shellacs, varnishes, lacquers, fillers—spray them speedily and profitably with Paasche Airbrushing equipment. And with no worry about after effects—Paasche perfection in design eliminates any danger of orange peel and pock marking or any other defects that are largely the result of imperfect atomization and application with inferior spraying systems.

Paasche perfection in the application of finishing materials has been developed only through years of study by Paasche engineers. Every unit in the system has been most carefully developed, perfected and coordinated so that now it can be instantly adapted to meet any finishing requirement.

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IF7-Gray

Greenish Tinge In Some Varnished Surfaces—II

Final installment of two-part article which explains several causes for the appearance of that characteristic greenish tinge, and tells how to prevent this objectionable color in varnished surfaces

By T. E. Moorefield

THE FILLER probably causes as much greening trouble as any other coat of finish. This may be due to poor quality in the filler, or to improper application. Some fillers are hard to wipe off clean. A smudge left behind on the work, may develop into a greenish cast. Other fillers do not contain the proper type of coloring matter and give greening trouble. Many black fillers are especially bad in this respect.

The proper handling of paste filler, in the package and in the pot, will do much toward removing one cause of greenish cast. The top layer of filler, in an opened package, will harden and oxidize in the same way as when properly placed in the pores of the wood. Such partially-oxidized filler is difficult to rub off clean, and is bound to give poor results.

Protect Opened Filler

The proper thing to do is to protect the surface of the filler in the opened package and thus prevent exposure to the air. For accomplishing this, the ingenuity of the finishing foreman will suggest means which are practical and adapted to his shop practice.

Unless filler is rapidly used, it should be supplied by the manufacturer in metal packages, not in wooden barrels. When filler stands any length of time in wooden packages, some of the oil binder is absorbed by the wood, and some usually leaks out between the staves, regardless of the good cooperage when the package was originally shipped. The net result is that the filler no longer has the proper amount of oil binder; it takes more thinner to make it suitable for working, it cleans off too thin, and in a short time it is likely to turn gray in the pores.

Avoid Excessive Filler

The main point, however, is that such a filler is hard to clean off. An excess of filler usually produces a greenish cast after being varnished, and detracts from the clarity of finish.

The cleaning off of filler is made difficult also, by failure to properly sand the wood before

Wiping off excess filler.

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staining or filling. Wood that carries a lot of "whiskers" is harder to clean and, in spite of care, it will catch and hold excess filler.

Complaint is frequently heard that the black fillers cause a greenish cast. This is probably due to the filler not being properly cleaned off. After the filler is dry, it is sometimes helpful to go over the surface with a rag moistened in a mixture of two parts of turpentine to one part of linseed oil. The use of a dark mahogany filler, made dark enough to show a dark pore, but still carrying some red color, may give an improvement also.

Dark Colored Varnishes

Some of the darker colored varnishes, when viewed in reflected light, have a greenish tone in themselves, particularly when several coats are applied. In such cases the use of a paler varnish, or some tinting color, will correct the difficulty. Unless the color is a permanent one, the finish may show a tendency to fade with time, accompanied by a gradual development of the greenish effect.

The quantity of tinting color to add to a varnish, of course, depends somewhat upon the shade desired in the final work, and upon the darkness of the varnish itself. Ordinarily about 1½-oz. of tinting color to each gallon of varnish is about right, but this quantity may need to be decreased or increased upon occasion.

Be Careful About Sanding

If a varnish coat is sanded before it is sufficiently hard, or if the sandpaper is too coarse, a grayish effect may be produced which, under successive coatings, may take on a greenish tinge. The varnish should be hard before being sanded, and very fine sandpaper—No. 4/0 or finer—should be used.

To show how a combination of causes may be at the bottom of greening trouble, a case taken from actual life is given. Investigation showed there were four major causes of the trouble in this particular case. Some of the veneer was soft and spongy, large quantities of glue were found in the pores, the stain was not of the proper type, nor was it properly handled, and the filling was carelessly done.

Combination of Causes

The stain was being used hot and it varied in temperature. It was heated at the beginning of operations, but cooled somewhat as the dipping proceeded. The stain also contained a large amount of black, which struck deep in the softer parts of the veneer, and had a tendency to reflect a greenish cast after being finished.

Where excessive glue was in the pores, it had a tendency to soften up under the hot stain and absorb some of the stain, with the same result as on the softer veneer after varnish had been applied. Due to the fuzzy nature of the veneer and to careless methods, the filler was not wiped off as clean as it should have been, and it left a hazy appearance on the surface.

Final Recommendations

The recommendations to eliminate greening in this case were as follows: The stain should be used cold instead of hot, or at least it should be kept at a uniform temperature, but not in ex-

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A WATER STAIN IN A NEW FORM

In a large furniture factory of Ontario, in the early part of June, Efficiency Engineers figured a saving of $1.25 per suite between Water Stain costs and Sunstand Stain costs. This saving was in favor of Sunstand Stain.

The grain was not raised, therefore no sanding was required; there was no blistering of veneers, and no loosening of glued joints!

Sunstand Stain is made with Water Colors only. It therefore stands the light, and bleeds only enough in shellac, or lacquer to give depth and beauty. It will fill just like a water stain.

At the new, lower price level on this product, any manufacturer who now uses any type of Stain whatever, would do well to investigate the possibilities of Sunstand Oil Stains.

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We are using water—oil stain. (Check)
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cess of 100-deg. F., to insure uniform staining and to prevent softening of the glue.

Excess stain should be wiped off immediately after dipping. The wood should be sanded smooth, and steps taken to insure the filler being wiped off clean. This may be accomplished by changing the wiping cloths frequently. By observing these precautions and by using one ounce of Kimball black to each gallon of varnish, the green trouble was eliminated.

Straining Finishing Materials

With the present day demand for production, every labor-saving item is of great value. One of the small items which will prove of value in making for cleaner work throughout the finishing department and also in saving a great deal of labor in the sanding and rubbing room, is the straining of all finished materials used.

Shellac, first-coaters, enamels and all final coats should be run through a fine-screen strainer or cheese cloth. All barrels, steel drums or cans containing finishing materials are supposed to be clean when filled and every effort is usually made by the manufacturers to see that they are cleaned before they are refilled again, but the surest and safest way to perfect cleanliness is to strain all material used.

At various times shellac will be found to be lumpy and full of small dirt specks; if it is not strained it will cause considerable trouble by clogging in the hose or spray guns, causing the surface coat to show nibs and dirt specks. Often this will cause considerable loss of time, due to the operators having to stop spraying and flush out the hose or take the gun apart in order to remove these small particles of dirt or lumps. The same thing will often happen when using unstrained enamels.

By straining all finishing materials and having a clean partitioned room in which to work, one can obtain a clean, smooth finish which will cause no trouble in the hose or spray gun; it will give a much neater finished article and save considerable labor in the rubbing room. The rubbed article will be free from small holes caused by dirt specks pulling out, thus marring an otherwise fine finish.—S. H. J.

A Sample of Aircraft Finishing

This office has received from a finish manufacturer, a small panel of very thin duralumin—an aircraft metal of great strength and extreme lightness—which is finished in the company's brand of red oxide primer and two spray coats of high-luster pyroxylin finish for metal and fabric.

It is claimed that these three coats of finish material add only 18¼-oz. of weight to every 100-sq.ft. of surface—lightness of weight plus protection and durability being very desirable qualities in aircraft finishes. The finished surface presents an excellent appearance.

New Safety Devices For Spray Operators

The Pulmosan Safety Equipment Corp., 386 Jay St., Brooklyn, N. Y., announce that they have made certain new improvements on two devices for men working at paint spraying of lacquers, enamels and pyroxylin paints. One of these devices is attached to the airline of the paint spray gun and automatically feeds fresh air to the operator at all times.

The other is a nose and mouth respirator or mask equipped with a chemical cartridge which neutralizes all the fumes and keeps out all the solids. The chemical cartridge, after being saturated, can be easily removed and a new cartridge inserted. Circulars describing these two new devices are being distributed.

Patching the Finish on Furniture and Pianos—II

Concluding installment of a two-part article which explains methods and materials used by workmen who are experienced and skillful in the patching of damaged places in modern finished surfaces

By F. D. Burchfield

THE REPAIRING of damaged spots on enameled or painted furniture is more difficult than on clear finishes, because of the necessity of exactly matching the color of the original finish. Deep mars or scratches should be built up with stick shellac and, after being rubbed smooth, should be touched up with an enamel of the proper shade.

In some instances it is advisable to procure the enamels from the furniture manufacturer, especially where the tints are delicate. With the advent of brushing lacquers, it is becoming quite popular to blend these to the proper shade and use them for patching, in place of the regular enamels, because of their quick drying feature.

Heating the knife electrically preparatory to burning in shellac for making repairs. Photograph, courtesy of S. Karpen & Bros., Chicago.

Where the mar or scratch does not extend all the way through the finish, it is sometimes advisable to rub or sand the enamel to a smooth surface and then touch up with a little lacquer enamel or color of the proper shade.

Clear Lacquer Finish

There are two methods in general use for repairing damages to clear lacquer finishes. Either the surface can be built up smooth with stick shellac, as in the case of clear varnish finishes, or a heavy-bodied, clear lacquer can be left exposed to the air until it becomes quite thick, and then laid into the scratch or other defect with a small brush, until the damaged surface is built up flush with the surrounding surface.

In either case, after the stick shellac or heavy bodied lacquer is dry the excess should be shaved off and the repaired spot sanded down smooth. Then apply a coat of lacquer—thinned down a little with reducer—over the damaged spot, brushing it out carefully to prevent showing a lap. The edges of the patch can be melted into the old finish by applying clear reducer around the edges. When the finishing coat has dried overnight, the surface should be rubbed, and polished where a luster is wanted.

Invite us to show you

Sun Flat Lacquer

We will display our goods at our expense, and give you practical advice. How best to use.

White No. 1 Lacquer

COLORLESS

Clear and transparent, looks like a coat of celluloid on work. Can be polished.

FINISHING ROOM FAVORITES

No. 115 Pale Rubbing

The reliable quality varnish that held its own so many years in the face of keen competition.

SUN VARNISH CO.

Louisville, Ky.

Precautions and Procedure

In using the burning-in knife on a lacquer finish care must be taken to avoid having it too hot. Also the knife should not be put down at a certain point and held there, but rather it should be dragged over the spot to be burned-in, with a quick, sweeping motion.

Wherever it is necessary to pad or French polish a spot, be sure to coat the padded spot with a thin coat of shellac before applying a new coat of lacquer. Where the thickened lacquer method is used for building up the surface, each application should be allowed to dry before the next one is applied; the final application should dry overnight before the excess is shaved off, to eliminate the possibility of shrinkage later.

Sometimes it is advantageous to use a mask for spraying large damaged spots, to prevent the over-spray or fumes from settling on the remainder of the surface. Wall board is satisfactory for making these masks, as it is sufficiently rigid to lie flat against the work and not be blown off by the compressed air during spraying.

Lacquer presents no more difficulties in patching than varnish. In fact, many users claim it is easier to patch lacquer than varnish, because lacquer solvents have a slight softening effect on the old finish and make it possible to melt in a patch without a lap or ridge showing, after the patch has been rubbed.

Lacquers are now so constructed that they can be easily brushed, which make them suited for refinishing work—even where spraying equipment is not available.

Colored Lacquer Finishes

To patch colored lacquer finishes, much the same general steps should be taken as in patching clear lacquer finishes except, of course, the proper color of lacquer enamel should be used to make the matched part match the original finish. In some cases it may be advisable to sand down the damaged part to a "feather edge" before applying the lacquer enamel on the patch, and in that way eliminate the necessity of building up the defect so much.

Lacquer enamels, now obtainable, can be applied either by spraying or brushing and they can be blended in any proportion to get practically any desired color or shade.

Again it should be remembered that the above suggestions are fundamental ones and that the exact procedure to follow in repairing a given damaged spot may vary slightly, according to the nature of the injury and the type of finish being repaired. Each individual case should be studied by the man in charge of patching work and a decision reached as to the best methods to use, before any actual steps are taken in the patching operations.

Corlear Products Co. Move

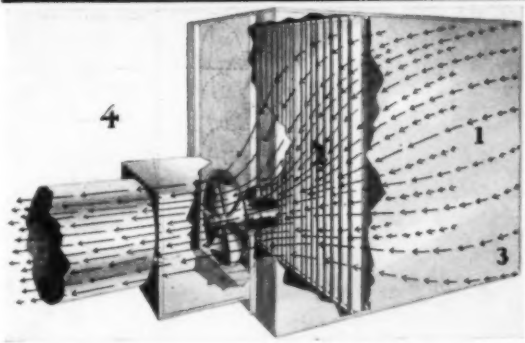
The Corlear Products Co., Philadelphia, Pa., manufacturers of varnish restorer, etc., announces removal to new and larger quarters at 1305 No. 27th St., where the firm will be located after July 1st.

A Lacquer Enamel Color Sheet

Denny, Hilborn & Rosenbach, Inc., have just issued a Dhrlac Lacquer Enamel color sheet with many usual and unusual shades shown. The company announces a new white lacquer enamel made in gloss, flat and egg shell.

LOWERS FINISHING COSTS
IMPROVES THE FINISH
PROTECTS THE OPERATORS HEALTH
LOWERS INSURANCE RATES

A Better Product at a Better Price



1. No dead air pockets—the result of its exclusive design.
2. Arrangement of baffle plates forces a uniform pull across entire face of booth. Other booths concentrate the pull of the air from the center of booth directly toward the fan.
3. No back drafts. Dust free spraying.
4. Fan or motor can be raised or lowered as necessary. Only fully enclosed motor on the market with endorsement of fire underwriters.

Melrock SPRAY BOOTHS

PATENTS PENDING

Endorsed by factory and insurance inspectors. Materially lowers insurance rates. Fire-proof.

The baffle plates are so designed that they almost entirely prevent any material from getting through and collecting on the fan or motor—thus delaying the cleaning period of the fan blades for months.

This booth not only keeps *all* the harmful fumes and gases from the operator's lungs, but simultaneously brings in a fresh supply of air. It also protects operator from all drafts that cause cold and stiffness.

Pneu-Gun ATOMIZATION

Lightest, shortest gun made. Has from 8 to 20 less parts than other guns and no packing or washers to break up free, steady flow of material or to cause color bleeding. There are no hose attachments at the front or the rear end of the barrel to throw the gun out of balance or to interfere with a free wrist movement.

Is non clogging, self cleaning, permitting a quick change in colors and materials. A light touch on this trigger instantly regulates width of stroke. New and exclusive atomization system enables this gun to give an enamel-like finish with ordinary paint—many times eliminates all necessity for rubbing.

Send for Catalogue Number 101 for important detailed information

AMERICA'S HEADQUARTERS FOR SPRAY FINISHING EQUIPMENT.

The MELLISH-HAYWARD Co.

Manufacturers *Established 1894*

211 W. AUSTIN AVE. CHICAGO, ILLINOIS

Improvements Prompted by Complaints About Finish—I

How buyers' complaints—which are more frequent during dull periods—led to an investigation that resulted in far-reaching improvements in establishing and maintaining higher grade standards

By E. F. Werner

LAST WINTER, when business was fairly good, there were no serious complaints about workmanship, finish or anything that would indicate that the products we were shipping were not up to the usual standard of our trade. Our company manufactures a medium and high-grade line of novelty furniture, which is often used in connection with the more expensive grades of household and display furniture. Under these conditions it is necessary that the various products manufactured be designed well and, above all, finished well, because it is more often that the finish will sell the article.

This spring, business was not so good. Complaints were received and, in some instances, shipments were returned. The administrative department decided that the manufacturing department had let up on the standards, with the result that poor merchandise was going out to the trade. It is the writer's experience that dull business periods mean more complaints than ordinarily. It is noticeable that more goods are returned during slack times. It is the writer's belief that these conditions exist primarily on account of economic reasons; if receipts are low, merchants have more time to find petty mistakes and blemishes, which would be overlooked during normal or busy times.

Inspecting Finished Furniture

It was thought best to make a thorough examination of conditions. There is an old adage to the effect that those who hunt trouble usually find it, and we did. Examination of stock in the finished stock room found many parts unfit for shipment. Why we had not found them before, we could not explain.

The inspection became supercritical, with the result that the percentage of rejections was so great that the whole manufacturing schedule appeared to be a joke, as far as production was concerned. Some of the pieces examined showed signs of peeling, some bubbling, others scars and scratches. It must not be understood that the whole lot, or even an appreciable amount, was below standard, but there was enough to be annoying.

The first thing suggested was that the lacquer we were getting had deteriorated in quality. We had made no change in our source of supply, nor had there been any appreciable price reduction warranting a decrease in quality. However, the argument was advanced that the people with whom we were doing business had done something to the lacquer.

Several interested individuals, including the writer, were not of this opinion, but to satisfy those who did make the accusation the

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IF you are not satisfied with your Lacquer try our quality products. For 35 years the World's Standard. Our Lacquers cost less per unit finished.

G. J. Nikolas & Co., Inc.

1227-35 Van Buren Street
CHICAGO, ILL.

Branches:

33-35 Grand St., Brooklyn
1150 Venice Blvd., Los Angeles
481 Tehama St., San Francisco

lacquer people were called in for consultation. They immediately denied any change in quality or formula, but they admitted that something was wrong with our finished product.

Lacquer Expert Investigates

The conference resulted in the lacquer company sending their chief demonstrator and technical expert with instructions to stay in our plant until the difficulty was solved. The first question asked by this man was, "Have you any samples of your standard finish?" We picked up several finished pieces and showed them to him. He noticed some difference between the quality of finish on the pieces and wanted to know which would just pass inspection. Three men present were qualified to pass on the quality of the merchandise before shipping and yet, at that moment, they could not agree as to where to draw the dividing line between passing and rejection.

In order to find out if there was considerable variation in our standards, as visualized by the three men above mentioned, 100 small table tops were taken from a lot just being finished and given to these men individually for inspection. The results were as follows:

	No. 1	No. 2	No. 3
Lot of 100			
Absolutely first class	72	77	84
Passable	14	11	7
Reject cabinet work	2	2	1
Reject finish	10	6	6
Nicks and dents reject	2	2	2
	100	100	100

In order to check this inspection, the men were told to inspect what they thought was another lot of 100 table tops, but which in reality was the same lot, with the exception that the two tops which had been rejected on account of nicks and dents, were replaced by two perfect pieces. On this inspection, the three men were asked to check as though one of the "cranky" customers was going to get the shipment. The inspection was as follows:

	No. 1	No. 2	No. 3
Lot of 100			
Absolutely first class	58	68	66
Passable	22	14	21
Reject cabinet work	2	3	1
Reject finish	18	15	12
	100	100	100

These tests immediately cleared up one vexing question. The nature of the goods manufactured made the personal equasion one of the chief factors in the inspection of the merchandise. Wood products, with their variations by nature, by climatic conditions and ease in being damaged, present a problem which is unique in itself and entirely different from the metal products.

If any arbitrary set of standards is adopted, rejections would be so great that the cost would be prohibitive. On the other hand, carelessness in inspection will result in letting down in the quality of the product, which naturally will cause more complaints and a loss of business. The best safeguard in such matters is to have a set of inspectors who can use judgment and discretion.

Chief Faults Discovered

The parts that had been rejected on account of finish showed two chief faults. One consisted of "peeling" and the other "sand scratches." The technical expert advised that the peeling was caused either by using the wrong combination of solutions, or by oil or grease on the surface. Poor spraying will also cause the effect. The remedy was quickly applied.

Air lines were taken down and thoroughly cleaned. Air filters

balanced

WHAT a balanced diet is to your own body, a balanced schedule of finishing is to the wood products you make. . . .

Our Studio Department is composed of wood finishing experts—in the heart of the furniture industry—in touch with the latest vogues, the newest style trend in designing and finishing. For five years this department has been offering a very valuable assistance to furniture manufacturers in the development and handling of new finishes, methods of finishing and finishing materials.

When the Wood Finishing Engineers of our Studio Service tackle a job they begin at the bottom, and leave nothing undone. If you have any finishing problem—or if your goods do not sell—get in touch with us. You won't regret it.

Grand Rapids Varnish Corporation

Main Offices, Factories and Studios at

Grand Rapids, Michigan

Jamestown, N. Y.
High Point, N. C.
Chicago, Ill.
Los Angeles, Cal.

finishing

were refilled and every spray operator was given the same instructions as to the method of spraying. Another point given careful attention was the assignment to one man of the mixing of any lacquer, should it be necessary at any time to increase the "flat effect."

A check on the sanding showed that this condition was the chief cause of inferior work, both in the finishing department and the cabinet room. The work was not entirely poor, nor was any one operator wholly responsible for the mistakes. It was simply due to the fact that, during the busy season, people had been employed who, according to their statements, knew how to sand and, with little or no training, they had been put to work on the bench. Possibly they had been shown for several minutes and then left to shift for themselves. The result was that any grade of sandpaper available was used to the possible detriment of the article.

(To be continued.)

Spraying with Compressed Nitrogen

One of the large manufacturers of compressed gases has recently put out cylinders of compressed nitrogen for use in supplying gas pressure to operate spray guns.

Of all the gases commercially available, nitrogen seems to be the best suited for the purpose. It does not burn as hydrogen does nor does it support combustion like oxygen or compressed air. It does not have the rapid cooling effect that carbon dioxide possesses and thus does not chill the sprayed material too much.

The gases are supplied in cylinders that contain 200 cubic feet which, at the rate of 6 cubic feet per minute, will operate a spray gun for over a half hour. Of course, this is entirely unsuitaable for production shops, but for small factories, refinishing shops and especially for painting contractors who find air compressors either too expensive or too bulky, tanks of nitrogen may find a place worthy of attention. The cylinders are provided with reducing valves and gauges that permit of regulating the pressure to the desired point.—S. P. Wilson.

Ronan Co. Completes New Lacquer Plant

T. J. Ronan Co., Inc., Brooklyn, N. Y., has now completed its new lacquer plant at Pacific and Columbus Sts., Brooklyn, N. Y. The firm reports that it has had to double the capacity of the lacquer plant in the past year, due to largely increased business in the automotive field.

Special Container for Shipping Lacquers

A shipping pail, designed to meet the particular requirements of lacquers and allied products, has been recently placed on the market by the Geuder, Paeschke & Frey Co. of Milwaukee. The container, known as the "Wedg-Seal," requires no crating or boxing. It is accepted for shipping as sealed and tagged, conforming to I. C. C. Specification 39-C.

The pail is equipped with a gasketed full width top which is sealed in place by equipment furnished the user of these pails. While the seal remains air-tight under the severest abuse, it is easily removed and replaced by the consumer who may wish to take out only part of the contents. A special composition metal coating on the interior and new type gasket prevent any deterioration of lacquers by chemical re-action. The full width top permits easy removal or agitation of the contents.

NEW!
QUICK-LAC

—a clear first coater
CUTS COSTS 50%

Quick-Lac is a new process, first coating varnish manufactured by the Boston Varnish Company principally for furniture.

Quick-Lac dries hard and is ready for sanding in 5 hours. It sands as easily and quickly as pure shellac and can be applied twice a day as a building coat. Yet it costs only half as much as shellac.

Use Quick-Lac and save 50%.

Special Offer: Send for Sample Barrel, today. Use 5 gallons of it, and if you are not more than satisfied with the results return the barrel at our expense.

Pennsylvania Representative
H. A. MAC BEAN
21 Mountwell Avenue
Haddonfield, N. J.

Boston Varnish Company
870 Everett Station **Boston, Mass.**

Finishing Wood Handles and Turnings—II

Continuing from Part I last month, this article takes up the finishing of handles with air drying finishes—varnishes, enamels and lacquers

By R. L. Masterson

WHEN baking facilities were not available, it was formerly necessary to finish with air-drying varnishes and enamels, or with shellac. In the case of varnish or enamel the finish was applied in much the same manner as outlined last month for the baked finish, except the baking operation was omitted. The finish produced with these air-drying materials was never as hard or durable as the baked finish and the long drying time cluttered up production to a certain extent.

Former Methods

For this reason many turnings, especially the larger ones, were finished by applying shellac with a brush or rag while the turning was still revolving in the lathe. This was then polished by holding cloths against the turning while it revolved.

Broomsticks and similar turnings are often finished by a rubber gasket or squeege process, wherein the excess finishing material is removed after a dipping operation by pulling the stick through a tight fitting rubber gasket. Shellac was formerly used for this purpose, but is being replaced rapidly by lacquer, because of waterproofness and other good qualities of lacquer.

The Lacquer Finish

Clear lacquers and lacquer enamels are becoming almost the universal finishing material for handles and turnings. Lacquers give the hard, durable, non-marring qualities that are so much in demand; they dry more rapidly than the old type baked finishes, without the expense of baking equipment or fuel; they give a much greater variety of colors than could be obtained by the old methods, and the finish is as permanent and lasting as could be desired.

Lacquers, whether colored or clear, are usually applied by dipping, although in a few instances they are applied by tumbling or by spraying, according to which method seems best suited for the individual problem. Long objects, such as broom handles, are frequently pulled through a squeege to remove the excess lacquer. Smaller handles are attached to a holding board and dipped by hand or by an automatic, slow-immersion dipping machine.

Machines of this type are now available which will turn out from 10,000 to 100,000 finished handles a day, depending upon the size of the handle and the number of coats applied. Such machines will dip articles up to 18-in. in length.

Dipping lacquer enamels are now available which will cover solidly in one coat and still dry with considerable luster. Until recently, the difficulty with col-

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Armitage
ARMORLAC
LACQUER SYSTEM
The Final Furniture Finish
Permits the most beautiful effects in natural and rich color combinations. Blends in easily with the designer's and finisher's plans for appealing and salable pieces.
A permanently beautiful finish which cannot be achieved with other types of finishing materials, yet application costs no more.
May we submit samples, or arrange for demonstration?
John L. Armitage & Co.
Est. 1876
NEWARK, N. J.
Varnishes--Lacquers--Japans
ARMITAGE VARNISHES

ored dipping lacquers has been to get solid covering without sharp edges and corners showing bare, and still have good flowing properties and good luster.

Usually, if the luster was maintained, difficulty was experienced in obtaining solid covering in one coat, and if solid covering was maintained the finish lacked luster. These troubles have now been overcome and lacquers are now obtainable which not only cover solidly in one coat, but dry to a glossy, hard, waterproof finish.

Number of Coats Needed

On smooth, close-grained wood, such as maple, birch, etc., one or two coats will give a very good finish. The more porous woods require one or more additional coats to stop suction of the wood. Where the wood is very porous or open grained, it may be advisable to first apply a coat of liquid transparent filler, made on an oil-varnish base and containing considerable pigment, to stop the absorption and fill the pores. Such a liquid transparent filler should be so designed as to not be "lifted" or "raised" by lacquer coats applied over it.

Where an extremely high luster is wanted, it may be necessary to apply a coat of clear lacquer over the lacquer enamel coats. Under ordinary drying conditions the lacquer should not be recoated in less than one or two hours, as too frequent coating may result in the formation of bubbles and blisters in the finished work.

In case the work blushes or turns a milky white, look for drafts of air that may be blowing on the freshly coated work. Also add a small quantity of blush retardant. If these precautions do not eliminate the trouble, then raise the temperature of the room, which will lower the relative humidity of the air and automatically remove the cause of the trouble.

Special Furniture Finishing in the Custom Shop

I read with interest a recent article in INDUSTRIAL FINISHING, in regards to the custom shop for furniture finishing. As there is much furniture today sold in the white—which calls for every kind of a finish and decoration—there

A spray outfit is practically indispensable even in the small custom shop.

is a very profitable field for a custom shop in every locality. But there are many things that are necessary for such a shop to make a profit.

The man who enters this field must be an A-1 finisher in every respect—decorating, striping, antiquing, matching every conceivable kind of material for colors, etc. The proprietor of a custom shop can get many nice little jobs

"Eliminate a Fire Risk"

NEWCOMB

SYPHON VENTILATED CABINET

THE "NEWCOMB" GIVES YOU everything you could want in a spraying cabinet and much more than you had thought possible.

Let us tell you about our latest and best development; the fan with direct connected motor, independent of booth, with rear of booth fitted with reclaiming chamber and baffle-doors.

Grand Rapids Blow Pipe and Dust Arrester Company

Dust Collecting Systems 527 Monroe Ave. Grand Rapids, Michigan

(Courtesy Hugh Lyons & Company, Lansing, Mich.)

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THIS SYMBOL is the Egyptian Lacquer trade mark. Its central figure is that of MAAT, *the Egyptian Goddess of Truth.* It typifies the integrity with which all Egyptian Lacquer products are made ... their precision, balance, and true quality.

Beautiful 16-page booklet

FREE

There is unusual charm and interest in a new booklet we have prepared, "ANCIENT AND MODERN EGYPTIAN LACQUERS." *We will gladly send you a copy. Please address the New York office.*

The maker who is proud of what he makes, uses Egyptian Lacquer

e standard for lacquer comparison

THE warmth, the depth, the life, the glowing beauty, the amazing durability of Egyptian Finishes have singled them out as the standard for lacquer comparison. "Not so good as Egyptian," you may often hear—"Better than Egyptian" you never hear!

Our Service Department conducts continuous experiment and research in order that the high Egyptian standard may be unfailingly maintained. The staff of that department will be glad to consult with you on any unusual finishing problems; write us as fully as possible, or ask a man to call.

Any special color "prescription" you may need, will be promptly and accurately filled.

THE EGYPTIAN LACQUER MFG. CO., INC., 90 West Street, New York

Completely equipped branches in charge of practical men *are maintained in the following cities:*

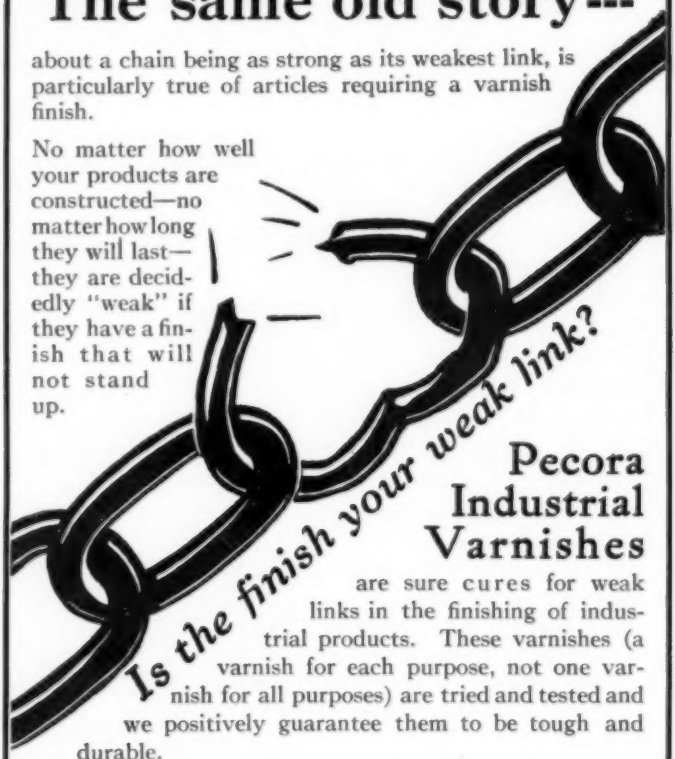
ATLANTA, BOSTON, CHICAGO, CLEVELAND, DALLAS, DETROIT, LOS ANGELES, PHILADELPHIA, PORTLAND, ORE., SALT LAKE CITY, SAN FRANCISCO, SEATTLE, ST. LOUIS

EGYPTIAN Lacquer

The same old story---

about a chain being as strong as its weakest link, is particularly true of articles requiring a varnish finish.

No matter how well your products are constructed—no matter how long they will last—they are decidedly "weak" if they have a finish that will not stand up.



Pecora Industrial Varnishes

are sure cures for weak links in the finishing of industrial products. These varnishes (a varnish for each purpose, not one varnish for all purposes) are tried and tested and we positively guarantee them to be tough and durable.

Let us supply you with a sample—tell us what you wish to try it on so that we can furnish you the particular varnish best suited to that work.

PECORA PAINT COMPANY

3rd & Sedgley Streets

Established 1862 by Smith Bowen — Philadelphia, Pa. — Incorporated 1911

of special colors from his local furniture dealer, who finds it cheaper than ordering the special jobs at the furniture factory.

One of the most necessary things is plenty of room, as furniture in course of treatment takes up a large amount of space. Of course, the size of the shop must be according to the size of the town in which one is working, keeping in mind too the possibilities of handling more work as or if business increases in volume.

A separate room for the sanding is also useful, but not really necessary if lacquers or quick drying finishes are used. Light is always necessary in finishing—the more the better—as no finisher can do good work in a dark room. Also, a nice light room is an attraction to customers. The shop should be kept clean and neat at all times.

Spray equipment is very useful—a small outfit is all that is necessary in this class of work. However, very good work can be done with the brushing lacquer.

One needs a stock of various materials, such as colors, turpentine, alcohol, shellac, stains, etc., to start with. One of the most important things in this line is to turn out first class work, as this is a good advertisement in itself and it will do more to bring in new customers than newspaper advertising.

Another thing is to avoid letting a lot of work lay around unfinished, as this takes the profits away. Complete the jobs and deliver them to make room for more new jobs. Be prompt in completing the work, and insist on prompt pay, as this is the only way to do profitable custom work. —J. K. Cooper.

Portable Spray Outfits

There are two distinct types of spray-painting equipment, the portable and the stationary. The stationary type is used in connection with the painting of furniture, automobiles and other miscellaneous manufactured commodities.

The portable equipment is of more particular interest to the engineer or contractor, as it supplies a speedy, easy, and economical method of painting stationary objects, such as buildings, tanks, bridges, standpipes and structural steel work.

The typical portable spraying outfit consists of a portable container of 3 to 15-gallon capacity, with control head for the regulation of air and paint pressures, one or more paint guns, which can be operated from one head if desired, an all-metal extension pole, air and material hose in lengths to meet all requirements, and a portable compressor unit, either gasoline engine or electric motor driven, with air storage tank, gauges and safety valves—a complete spray painting equipment.

Vibratory Electric Strainer

The Vibrating Machinery Co. of Chicago, Ill., announce a new vibratory electric strainer, which is built for large production and continuous operation under hard service conditions. It is adapted for dry and liquid materials of all kinds and screens of any mesh with automatic discharge of tailings or oversize. The screening surface is 72x22-in., or 1584-sq.in. The motor and eccentric wheel impart a horizontal gyrating motion and vertical vibrations to the screen, retarding the oversize of liquids, giving it time to drain thoroughly before being discharged. The motor is ½-h.p., 1725-r.p.m. The "Screen Hog" is furnished complete, arranged and ready for connection to the standard electric light socket.

Industrial Finishing

PRACTICAL PUBLICATIONS, Inc.
Publishers
Room 603, 222 E. Ohio St.
Indianapolis, Ind.

Issued monthly. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

EDITORIAL

Suitable Safeguards Remove Danger of Explosion

The hazards in the use of nitrocellulose lacquers and the need of precautions to render their use reasonably safe are, as a rule, known and recognized. The safety measures ordinarily followed in the application of paints and varnishes are generally deemed insufficient for lacquers. Sufficient ventilation to remove lacquer vapors that may be present; protection against ignition from open flames or lights, exposed electrical connections, wires or lighting systems, or motors of such type as are likely to spark and which are located within the vicinity of the finishing operation; prevention of undue accumulations of lacquer residue in or about the spraying locality, and reasonable precautions as to the storage and handling of the materials to be applied—these are considered the principal and essential safeguards.

Above all, continued cleanliness and adequate ventilation of the entire department are vitally important.

Furniture Production by States

Some interesting data has been compiled by the National Lbr. Mfgrs. Association showing furniture production by the different states. Figures quoted from the U. S. Census Bureau show the value of wood household furniture by kinds and by states in the year 1925.

According to these figures New York leads in the production of wood household furniture with a total of $88,926,449 for the year 1925. Illinois comes second with $72,198,548; Indiana third with $67,737,758; Michigan fourth with $58,059,296; North Carolina fifth with $48,149,403, and Pennsylvania sixth with $42,584,570. These figures represent the total value of wood household furniture produced.

These statistics show that North Carolina leads in bedroom furniture, while Michigan leads in living-room tables and desks, and Indiana in cabinets and kitchen furniture, while Pennsylvania leads in dining room furniture.

This data also shows that wood furniture increased ten percent in the year 1925 over 1923.

Declining Prices and Better Profits

Manufacturers, faced with the problem of steadily declining price levels for their class of products, encounter another problem in making as good a profit in 1927 as they did in 1926.

To illustrate, as prices go down under the stress of competition, the usual course is to hammer down production costs with the hope of at least preserving the same relative margin or percentage of profit per unit of sale. However, this usually means

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A most unique and distinctive finish!

Pioneered as a leatherette finish for radio horns, its variety of attractive combinations has brought it into use for many other articles, such as radio cabinets, furniture, fixtures, novelties, toys, etc. Ease of application—uniformity of pattern—combinations to suit your particular requirements, are outstanding qualities of BREVOKRAK.

Thorough-going demonstration made at your plant if desired.

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smaller actual money profit per unit, and the problem then becomes one of selling enough more units at the lower price to make the same annual net profit as before. This effort to increase sales volume may so add to a company's cost of doing business that the savings it makes in production are lost in the distribution of its product. In that case, even with the greater volume sold, net profit may not be as good as in previous years.

Therefore, as a safeguard against smaller net profit, we suggest simplification. It has been definitely proven in numerous instances that "simplification" reduces both the costs of production and distribution. It has likewise been definitely proven that "diversification" adds to both production and selling costs.

Yet there are many manufacturers who believe the best way to get more business and to make more profit is to add another number to the line. That would work out profitably more often if they, at the same time, dropped some slow-moving number, even at the risk of not being able to supply it on an occasional order.

The usual practice of striving for greater volume by adding new lines, meanwhile hanging on to all the old ones, soon makes the whole line top-heavy, and inventory rapidly piles up with items that do not turn over. Profits that would otherwise have been made on the live lines are absorbed in the costs of carrying the dead ones in stock.

As the variety increases, the burden on plant facilities and the whole production personnel increases, and sooner or later manufacturing costs go up instead of down. The selling organization is pushed to spread its effort over the expanded line, and the consequent diffusion of effort usually increases the cost of selling per unit of sale, faster than it increases the total volume of units sold.

A minimum consistent range of line numbers—all active, carrying no dead weight, made and sold in large volume, even at a smaller cash profit per unit—this means good annual net profits.

The manufacturer who can thus keep his production and selling forces "stripped for action,"—the manufacturer who has the courage to "simplify" rather than "diversify",—need not worry about better profits in the face of declining prices.—News Bulletin, U. S. Dept. of Commerce.

LACQUERS for Wood

Pioneers in wood lacquers that give a finish that lasts. Made to satisfy users for sixty-nine years. Write us your requirements.

Chas. Cooper & Co.
90 Worth St., New York
Works—Newark, N. J. Since 1857

Refinishing Sewing Machines

The following is a detailed schedule of operations for refinishing sewing machines with brushing lacquer:

1—Pickle machine heads in a solution of lye and water.
2—Wash with plain water.
3—Rub down with fine steel wool.
4—First coat of black brushing lacquer.
5—Second coat of black brushing lacquer.
6—Coat of clear brushing lacquer.
7—Transfer name.

The metal tops, after being cleaned are given a coat of lacquer-primer, then finished same way.—J. C.

In Europe Berryloid is considered the highest development in pyroxylin enamels

THE PERMANENT
BERRYLOID
HIGH LUSTER LACQUER

When a manufacturer gives his product the finest finish money can buy- the public has good reason to believe that quality goes all the way through

BERRY BROTHERS
Varnishes Enamels & Lacquers
Detroit, Mich. Walkerville, Ont.

Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Embossed Trade Mark on Handles

We have recently seen some hickory tool handles on which the trade mark was stamped or embossed in gold. As we have had requests from our customers for this same thing, we are interested in knowing how it is done, what equipment is required, etc. Can you give us any information.—E. T. W.

We are not familiar with the exact procedure used by anyone doing this work, but there are several ways in which the results could be accomplished. One method is to print the trade mark with gold ink on the wood by means of a printing press in a manner very similar to that used in printing paper.

Possibly the same results could be obtained by means of a hand stamp which would be held against the handle and tapped lightly with a hammer to indent the wood slightly, transferring the ink from the stamp to the wood at the same time. In either case, after the ink had dried the handle could be finished with shellac, wax, lacquer, or by any of the customary methods of finishing.

Another method of showing the trade mark in gold would be to have one of the decalcomania transfer companies make a decalcomania transfer which could be applied to the handle and finished over with lacquer, shellac, varnish or any other similar material, after the paper backing on the transfer had been soaked with water and removed.

Still another system that could be used is to stamp on the handle with a rubber stamp, a thin coating of clear varnish to act as a size for gold bronze powders. After this stamping has been allowed to stand in the air for several minutes to take on a "tack" or sticky condition, gold bronze powders could be flown or lightly tapped on to the handle. The gold would adhere where the size coat had been stamped, but would not adhere on the other parts. This would allow the trade mark design to stand out in gold and, after the size had been dried thoroughly, this could be finished over with lacquer, shellac or varnish.—I.F.

Paint Peeling; Glue Sizing

The comments of Mr. Norot, which appeared on page 66 of May issue about certain articles in March INDUSTRIAL FINISHING, bring up a question for discussion, namely, why paint peels. On page 10 of March issue, the article, "Why Paint Peels," mentioned a lead paint used too thick, or lacking in enough oil to allow it to penetrate into the wood and still have enough to hold the lead together and prevent chalking or flaking in a short time.

The general theory among paint men is that where paints containing zinc are used, this

To Readers Of

Industrial Finishing

This journal is designed especially to suit your particular needs and we want to know what information you desire, what problems or difficulties you have and how we can assist you in your work. It costs you nothing to make inquiries or to tell us what subjects you wish to see discussed in our reading pages.

Many times you have probably felt prompted to write some of your own experiences, opinions or ideas. Now is your opportunity. INDUSTRIAL FINISHING solicits articles from practical men and pays for all acceptable material.

Kindly express yourself by writing us just what subjects you would like to see covered by articles in the publication; or just what subjects you might write on for publication. Address your communications to

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makes a hard glossy surface and, after several coats, it soon starts to peel. Nine times out of ten an improper first coating causes the whole trouble—usually because of a damp wood surface or because there was not enough oil for the wood. In my own article on putties for lacquer, on page 14 of March number, I could have mentioned a dozen various defective fillers all of which are good today.

Regarding "Finishing Fiber Furniture," on page 60 of May issue, the trouble may be caused by enamel conditions, but I would think that the main cause is from the glue size. The company states that it uses two coats of glue; this is too much, as a glue sized surface is a very risky thing to paint over, especially if the glue has been used too heavy. When not used properly, it always causes peeling or some other difficulty. The trouble is no doubt caused by a poor grade of material and too much glue.—J. K. Cooper.

Two-Tone Finishing

We would appreciate your advising us how two-tone work is done—whether with one coat or two coats.—S. D. C. Co.

The expression "two-tone work" no longer conveys a very definite meaning as to the exact type of work to be done. Originally it referred particularly to work on which two shades of stain were used, leaving a border or inside panel in a different tone than the other part of the work.

Now the term is sometimes used to indicate the shaded, antiqued, or mist-sprayed effects produced either on clear varnish or lacquer finishes, or on lacquer enamel finishes.

In the case of two-tone stain effect, the staining can all be done at one time, merely using different strength of stain on the different parts. The antiqued, shaded, or mist-sprayed effects, whether on clear finishes, or colored finishes, are produced by at least two applications—one of the undercoat or ground color and the other of the shading or misting color. The shading is not done until the undercoat color is dry. Usually a coat of clear lacquer, shellac or varnish is applied over the entire surface after the shading or misting has been done, thus making this at least a three-coat job.—I.F.

Finishing Those Incubators

In reply to I. R. S., page 66 June issue, regarding the finishing of incubators for outdoor purposes, we suggest the use of a good grade substitute shellac, applied with spray gun. This to be followed up with a good spar varnish. It should be unnecessary to apply any materials on the inside of these incubators.—Binks Spray Equipment Co.

Silver Gray Finish For Oak

I notice in a back issue of INDUSTRIAL FINISHING, that some one requested a formula for finishing oak in "silver gray." It is done as follows:

First, wet lightly with water, the wood surface to be stained; when it is dry sand it down carefully and smoothly. Then use the following stain:

Dissolve 4-oz. of jet black nigrosine in 4 gallons of hot water. After stain is dissolved, add

Good Lacquer

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Rockford Varnish Company lacquers have made good. Where competitive tests have been made they have usually been the winner. You should try them out in some practical tests.

"No Tampering with Quality"

The
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Company
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1 gallon of 26 per cent aqua ammonia. This gives five gallons of stain. The ammonia gives you the desired tanning effect.

After the stained surface is dry, take natural paste wood filler and, to every 5-lbs. of filler, add one pound of white lead ground in oil. Then fill and finish with white shellac. Sand and wax. Do not use orange shellac as it will turn the finish green.—Theo. Noll.

Lacquering Steel Parts

Please advise how to lacquer steel machine parts which are to be used for display purposes, in order to keep them bright and to avoid rust while these parts are on display in dealers' stores. This is only an occasional operation with us and we have in the past experienced such trouble as clouding, peeling off and rough finish.

Can you advise in detail the proper procedure for doing this lacquering? Can the cleaning and lacquering be done mechanically, with the assistance of a continuous chain dipping the parts into tanks containing the cleaning fluids and lacquer, or would you advise hand work entirely or in part?—A. O. D.

Not knowing the exact nature of machine parts which you propose to lacquer, in order to eliminate the chances of rusting and tarnishing, writer wishes to make the following observations.

It is a patent fact that lacquer and surface dirt do not go hand in hand. Consequently the first step you will need to take will be to thoroughly clean the parts to be lacquered. For this purpose I would suggest the use of a good grade of light naphtha, such as V. E. P.'s. This will remove dirt, grease and other foreign matter.

In actual practice the parts may be strung on a conveyor and passed through a tank containing light naphtha. About the only manual labor necessary for this work will be the wiping of these parts as they emerge from the naphtha dip and travel along conveyor.

Next, the parts should be given a dip coat of clear lacquer. Such a dip coat should be allowed to drain about two minutes right over the lacquer tank. The parts thus lacquered will be dry to touch at room temperature, in about 10 to 15 minutes, and will set hard with an extremely good "nail-down" in about 8 hours.

A word may be said in regard to clear lacquer suggested for use. Clear lacquers containing ordinary lacquer grade gums will not stick thoroughly to the metal, and may eventually start to peel off. They will even cause cloudiness.

While a good grade of lacquer, containing the right kind of gum, will stick to the metal parts very well, it will also have a degree of clarity that will be hard though not impossible for a layman to differentiate, especially between a lacquered and unlacquered surface. It goes without saying that the degree of luster

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GLOSSY—FLAT

Our glossy body lacquer can be polished to produce a very high lustre. It will not chip or check—sprays freely.

For a dull-rubbed effect our flat lacquer produces an excellent finish at low cost . . . where competition is keen this particular material will be found extremely advantageous.

These lacquers are not an experiment—they have been tried and tested and are being used very successfully by hundreds of furniture manufacturers. We spent years developing them, and were firmly convinced that they would accomplish all that would be expected of them before we offered them to the trade. Liberal samples on request.

Indianapolis Varnish Co.

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Indianapolis, Indiana.

will be high and more or less permanent.

In closing, would suggest that you secure from various manufacturers for personal information, steel panels coated with a good grade of lacquer. Scratch them with a knife blade held to surface at an angle of about 45 degrees. This will help in comparative evaluation of lacquers.

The conveyor system of lacquering is ideal for lacquer industry in general and more so in your case, because the parts seem to be small. Will be glad to work out details, both mechanical or otherwise. If a sample is sent to writer, care of INDUSTRIAL FINISHING, it will be returned to you with a hard lustrous coat of clear lacquer.

It may also interest you to know that scores of steel and silver frames, etc., in my home have had a coat of clear lacquer and have never needed any attention. —K. N. Kathju.

Before steel is lacquered it must be absolutely free from dust, rust and other impurities. An automatic dipping machine can be made to do the cleaning, washing, drying and lacquering. This would be rather costly unless there are a great number of parts to be treated.

If the parts to be finished are not to receive much abuse after process, a practical method would be to dip into cleaner, rinse and dip into water-dip lacquer. The excess water may be drawn off every morning or noon, through a faucet in the bottom of tank. All water-dip tanks should have this faucet, and should be made of tin—not galvanized iron.

This finish is not so durable as a combination gum and cotton lacquer, but it is much cheaper. A still simpler process is to dip all parts into clean thinner, allow surplus thinner to run off and then dip into lacquer. There are on the market a variety of dipping racks, made for metal parts. Unless the parts are too large or heavy, several can be dipped at a time by using one of these racks.

Still another method consists of automatic spraying by means of an endless belt. If the parts are too complicated for this, they could be sprayed separately.

All lacquer rooms should be free from dust, drafts and sudden changes in temperature. On humid days a drying oven may be used to prevent blushing.—Edward M. Stephenson.

Spray Gun Static Did Not Cause Briggs Fire

Considerable conjecture and speculation have been rife as to what caused the partial destruction of the five-story building of the Briggs Manufacturing Co. at Detroit, on April 23, 1927. One report gave out the opinion that a spark of static electricity from spray guns in service caused it, but in the light of information developed after this report was circulated, officials of the Department of Labor and Industry of Michigan say they are convinced that there were no grounds for including in the preliminary report any reference whatever to static electricity in or at the nozzle of a spray gun.

The reports of the assistant fire marshal and of representatives of insurance companies—made after investigation—indicate that the igniting spark that caused the initial fires and subsequent explosions, followed by conflagra-

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tion, originated "around the resistance coil of the mercury light located at the booth where the last color was applied," or "inside the auxiliary box around the mercury vapor lamp, and a flash or flame was also seen at one end of the vapor tube." This, it is said, caused an explosion of dry pyroxylin dust which had accumulated around the resistance coil.

Quoting further from the report of the asistant fire marshal, we read:

"It is my opinion that the smoke that Clint Brown (one of the workmen) saw coming from the coils of this light was the gases from pyroxylin dust that had settled around this coil and had started decomposing from the heat of this coil before igniting spontaneously, which in turn, ignited inflammable vapors which are present where pyroxylin lacquers are used, causing an explosion."

Tack Rag News

Realizing the need in the industry of a ready prepared tack rag which will retain its tackiness indefinitely and at the same time offer safety from the danger of spontaneous combustion, the Wm. A. Juergens Co., of Toledo, Ohio, has brought out a prepared cloth called "Magic Tack Rag," which has the tacky quality required for clearing finished surfaces of all dust specks, lint, etc., but which does not leave any sticky deposit on the surface being cleaned. Each rag is folded like a handkerchief and sent out in a glassine envelope. In automobile finishing and refinishing, it is claimed that one of these rags can be used on at least a dozen jobs with complete satisfaction.

SUPERIOR WOOD STAIN POWDERS

For Lacquer and all finishes.

Complete variety of shades. Samples and information on request.

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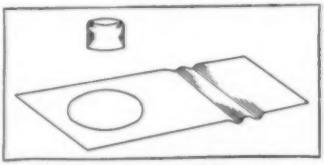
Lacquered Metal Stamped

A sample of piece lacquered thin-sheet brass and a cylindrical cap, which has been cut and stamped from part of it, have been sent to this office to show the possibilities of lacquer-coating large flat sheets of metal and



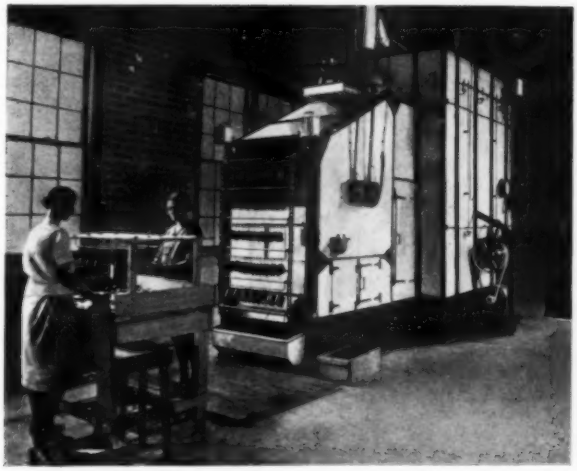
Sample lacquered sheet of brass and the stamping cut and pressed from it.

then cutting and stamping them to make whatever shaped articles may be desired. The flexible, colored lacquer coating was not harmed by the machining operation, nor was the coating on the sheet of metal harmed by bending it back and forward repeatedly where the wrinkles show in the accompanying drawing.

A Boston furniture manufacturer, who has tried out a new attachment for spray guns, reports that it has enabled him to do away with cost of masking when finishing tables or sideboards in two colors, and in finishing cane chairs.

This Section is devoted to the application, baking and polishing of finishes to be dried in ovens.

Baked Finishing



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DAYTON, OHIO

More Successful Bake-Finishing

Revealing practical information on the heating, ventilating and operation of baking ovens, and pointing out the causes of and remedies for many defects common to baked finishes

By E. H. Langendorf

THE BAKING ENAMELS and japans of good quality generally are more elastic and weather-resisting than air-drying coatings; in fact, an air-drying enamel baked on, usually is more weather-resisting than when air-dried.

Uniform Oven Temperature

Baking equipment should provide for uniform temperature in practically all parts of the oven. To accomplish this, the construction and design must provide sufficient vent piping, properly located, to allow adequate circulation of air for uniform temperature; the exit to be as direct as possible to the outside air and of such height above the top of the oven as would create the necessary draft to quickly take away the fumes.

Some engineers figure that there should be about 20-sq. in. of vent area to each 100-cu. ft. of oven capacity, and also that the dampers should be so arranged that they cannot cut off more than two-thirds of the cross-section area of the vent pipe. The feature of oven ventilation cannot be stressed too strongly, because proper ventilation is as necessary to produce satisfactory results from the use of japans as it is to produce and retain good health.

When an oven is constantly filled with fumes or smoke the proper luster is not obtained on the finished work. The surface is apt to have a cloudy or smoky appearance, and will likely be covered with little specks of dirt. Aside from these considerations, there is great danger from possible explosion and fire, under wrong conditions.

Oven Ventilation

If the work is crowded in an improperly ventilated oven, some of it will surely come out underbaked. What generally occurs is that the parts hung near the walls will be baked out, nicely, but those in the center of the oven will be soft.

With poor ventilation, sometimes the fumes are so heavy that the finish is entirely wiped off the edges of the work. To some extent these troubles can be lessened by hanging the articles further apart and also by running up the heat very slowly, but it must be finally stated emphatically that japans must have air to bake out properly.

Insist on Cleanliness

Beside specks of dirt on the work, caused by smoky ovens, there are other conditions such as trucking, open doors or windows, accumulations of dust or soot on oven walls and flues, dirty hooks, uncleaned metal, etc. Perhaps the most general and troublesome form of dirt is caused by an accumulation of japan on the hooks used for dipping. Sharp edges of the steel cut these accumulations, allowing the japan to loosen the particles as it flows off, sometimes causing a dirty streak all

the way down a fender or sheet of steel. The hooks should be burned off and cleaned as often as required, and then any scale or rust formed on the hooks after burning off the japan should be removed by pickling in dilute muriatic acid, if necessary.

Floors in the japan room should be oiled to keep down the dust, and as little trucking as possible should be done while unbaked work is exposed. Of course, the metal should be clean before it is dipped, but all rags must be kept out of the finishing room to prevent floating lint, if clean work is desired.

Dirt will show plainly in a japan before it is baked, therefore if the japanned metal looks clean when it goes into the oven and then comes out dirty, the oven is dirty. If the japan in the dipping tank becomes dirty, empty the tank and wash the sides and bottom carefully with reducer, but never use alkali in washing the tank. Then strain the enamel through the strainer as previously described.

Any japan applied over a rusty surface, or on metal washed in alkali and not rinsed thoroughly, will flake off; likewise if too many high-baked coats are applied, or if the japan is overbaked. A heavy coating of japan on gas ranges, heaters, and similar articles, if subjected to too intense heat, will crack and flake off, whereas a thin coating will char through only at the hot point; therefore for oven sides the thinner the coat the better it will stand up in use.

Sometimes the coating of japan will be almost entirely washed off the metal, this frequently occurring during cold weather in the case of heavy castings. Poor oven ventilation may be the cause; if so, leave the oven door open until the work is smoking freely. A more likely cause of the trouble is moisture in the pores of the iron being driven out in the baking. When this is determined as the cause, the iron should be heated to drive out the moisture before dipping.

Blooming; Wrinkling; Silking

Although most cases of "blooming" are traceable to poor ventilation of ovens, a finish having a bluish cast frequently results also from reducing the japan too strongly with kerosene.

If only part of the work in an oven wrinkles, it is generally that section hung nearest the burners, which should be guarded to prevent this trouble. Wrinkling is usually due to applying japan too heavily, not allowing sufficient time for it to drip before going into the oven, and then running up the heat too rapidly, or to temperatures too high.

A good japan, properly reduced, should not sag, nor overlap; sometimes a little kerosene will overcome the poor flowing which is the cause of these defects, although sagging often results from not thoroughly stirring in the reducer. Turpentine, used as reducer for japans, has been found in some cases to have caused "silking", which is a very annoying blemish as it covers the entire piece and kills the luster.

This defect shows as faint silk-like lines running parallel with the flow of the japan, and is a condition most prevalent in first-coats or dull blacks commonly called "rubber finishes," but it never should occur in finishing gloss coats. When it does occur in the finishing coat it may be

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A BIAX man recently found a plant where the castings would not take a proper lacquer finish.

He soon proved that a BIAX finished casting had a better, cleaner, surface that enabled the lacquer to dry evenly and quickly.

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caused by the "silks" in the first coat showing through the more transparent finishing coat, in which case it can be overcome by rubbing down the first coat. Or it may result when the finishing coat is applied too heavily, or when the japan is too cold and not allowed to complete its drip before baking, or when the heat is run up too rapidly the same as explained about wrinkling.

Cause of Pitting

Pitting also is a very common trouble, the articles coming from the oven partly or completely covered with small pit marks and sometimes with large blotches. Should this seem to occur periodically on Monday mornings, it is caused by the oven sweating—moisture gathering on the walls of the oven. To overcome this, heat the oven and allow the door to be open part way before using it for the day's production. Oftener, however, pitting is caused by grease in the metal; this must be eradicated before a smooth finish can be obtained. If for any length of time greasy metal has been dipped, the japan in the dipping tank will be contaminated with grease and cause pitting on all the work following.

Dipping and Bake-Finishing Sheet Steel

In your April issue we notice you have an article on "Dip Finishing and Baking Equipment," but this refers to articles made of wood. Can you inform us whether or not anyone is successfully dip finishing and baking articles made of sheet steel? We understand that some firms are doing this work, but none of the salesmen of enamels seem to know

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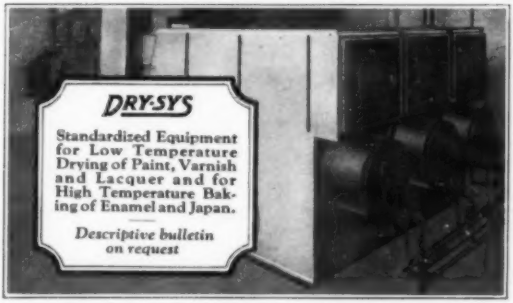
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anything about this class of work.—P. N. Co.

The article on Dip Finishing and Baking Equipment in the April issue of INDUSTRIAL FINISHING referred to the finishing of bed springs and other objects made of metal, and not to articles made of wood as you mentioned in your letter.

Many other sheet steel products are successfully finished by dipping and baking. For example, we know of a company making toy automobiles of sheet steel that are large enough for boys to ride in. These juvenile automobile bodies are dipped one coat in colored bake-enamels and baked for about 2½ hours at 180-deg. F., giving a solid covering of hard, tough, durable finish with a good gloss. In fact, this particular line of juvenile automobiles has the reputation of being as well finished as any on the market.

Of course, many other sheet metal articles, such as automobile fenders, hoods, radiator shields, steel filing cabinets, metal furniture, and such objects are dipped and baked, many of them on automatic conveyors which automatically apply the enamel by dipping and carry the dipped parts through continuous ovens where the finish is baked.—I.F.

Refinishing Motor Cars in Small Shop*

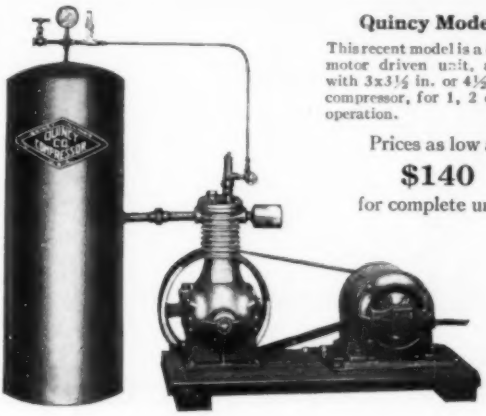
Consultant on finishing problems gives specific and detailed instructions for refinishing automobiles in the smallest type of shop—according to the latest approved methods

By K. N. Kathju, M. S.

FIRST "double coat" above belt moulding. If it is desired to finish the upper part of the car body in black, above the belt moulding, it may be given a double coat of reduced black pyroxylin, such as was previously used on the fenders. The fogging of a part of the car body below the moulding should be disregarded. However, if a lacquer of some color other than black be specified by the customer, the material should be reduced with its own volume of lacquer thinner, as mentioned heretofore, and sprayed on the upper part of the car body, as recommended above.

Note: Opinions differ in regard to the question of finishing the upper or lower half first. In general practice, it will be found that the finishing of upper part first, and then its subsequent masking, is infinitely easier than to finish and mask the lower portion satisfactorily. However, the operator is at liberty to find out for himself by trying both ways and then selecting what suits him best.

*Continuation of article that began in May issue.



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The heart of your paint spray outfit is the compressor. Make sure that yours is a Quincy. Then you'll know it's ample in size and power—a source of uniform pressure and dry, clean air that you can always depend upon.

In the complete Quincy Line are models for use with all standard spray gun outfits. Each is engineer-built by us, according to our original designs. Each will pay its way in your shop, earning profits by helping you turn out better jobs; lowering costs by insuring continuous service and long life. Full information gladly sent upon request.

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K751

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You Can't Paint with Lubricating Oil

You know that, to do a good spray-finish job, the air *must not* carry lubricating oil into the paint.

Even the best filters will not keep air entirely clean if the compressor throws excess oil to clog the filtering element.

Investigate the CURTIS Compressor and you will find that its patented *controlled splash* oiling system will not overload the filter. Practically all spray equipment manufacturers use or recommend it because of this safety feature.

Every Curtis operation—design, precision manufacture, final work test—is based upon knowledge gained by 73 years of experience (30 years devoted to pneumatic engineering).

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Air Dry 10 Minutes

When a high class finished surface is desired, it is suggested that the first double coat be air dried two hours and water sanded very lightly, using No. 320 A1 oxide paper, before applying the second coat. For average work, sanding between coats is unnecessary, consequently the coat may be air dried ten minutes.

Second Double Coat Above Belt Moulding

Spray a second double coat of reduced lacquer, as used previously, making sure not to pile on the lacquer too thickly. It is cheaper and better to put three or four light coats of lacquer on a surface than to pile on two or three heavy ones. A few reasons for this are:

1—A coat sprayed on by holding the air brush too close to the surface, with the idea of piling it on, will certainly result in waves, runs, sags, etc.

2—A heavy coat will soften the undercoats to such a degree that sanding and polishing may have to be put off two days or more.

3—A heavy coat, even though properly sprayed, will result in excessive "orange peel" through improper atomization of a bulk of lacquer being forced through the air brush.

4—Lacquers dry by evaporation. In so doing, a heavy coat has locked under its dry surface a greater percentage of volatile material. This must be let loose from its captivity before the coat dries. The only possibility is to disrupt the dry surface film, and this is what actually happens. The solvent forces its way out through myriads of little holes, thus weakening the film.

The second coat may be allowed

You kin hide de fier, but wat you gwine ter do wid de smoke?

THIS very snappy remark was originated by Joel Chandler Harris, one-time editor of the *Atlanta Constitution* and creator of the Uncle Remus stories. It very happily applies to the buyers of lacquers.

Practically every freshly sprayed product looks fine.... but when the weeks and months roll around and crazing, cracking, chipping, peeling, roll around with them ....somebody catches it for hiding the fire. First the dealer gets it, then he passes it to you.

What a lacquer will do is in the lacquer when the drums come into your plant. If your product's finish stands up for ten years....that was in the lacquer, if it falls down in three months....it was in the lacquer.

Users of ALAKA, the Practical Lacquer, are not finding these difficulties. When you buy ALAKA you don't have to be a smoke-eater....

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Extra Fine Shellac

You know what a good finish pure shellac makes. But until you have tried Du-Pros Strictly Pure Shellac you have not used the best.

Du-Pros Shellac is made by an extra process that gives it extra value.

Ask for sample

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Manufacturers of
WOOD FINISHING MATERIALS

to air dry ten minutes before proceeding to spray the third coat.

Third Double Coat Above Belt Moulding

In general, three double coats of pyroxylin lacquer are enough for any car. However, as many coats as desired may be put on. More than five double coats should never be necessary.

Operation No. 22—Air dry about 20 minutes.

It will be noticed that the air drying time for this last coat case has been doubled. The reason is this: The upper part of the car body now has been masked, so that the part below the moulding may be sprayed—consequently the precaution. The upper part will dry hard enough, even in ten minutes, to permit masking with paper and adhesive tape.

Masking Fender and Part Above Belt Moulding

If the fenders have not been removed, it will be necessary to cover them with ordinary newspaper—paper that is free from holes and tears. The paper may be easily put in place by forcing the edges in between the body proper and the fenders, dust shields, apron, etc., with a putty knife. However, a good lacquer-grade adhesive tape may be used to hold paper in place. The upper part may be papered to about 9-in. above the belt moulding. It is not necessary to cover every inch of finished surface. Only about 9-in. above and below the surface to be finished should be masked as a necessity. However, an operator who is probably a novice at the art of spraying may have to cover the entire finished surface.

WORTHINGTON

Worthington Feather Valve Compressors

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for Economy

Mass Production of Worthington compressors insures uniformity and interchangeability of parts.

Force-feed lubrication positive and fool-proof, reduces wear of moving parts, and definitely limits the amount of oil in the discharge air.

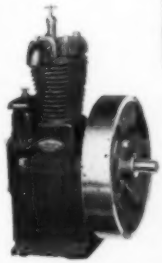
Radiating surfaces make for lower compressed air temperature which with ground in piston and rings reduces carry-over of oil and water.

Two-part removable bearings make easy and cheap replacement.

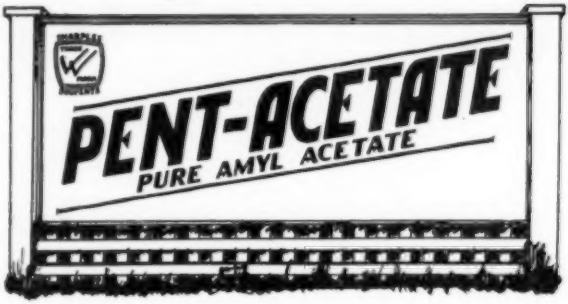
Automatic Pressure control devices reduce power consumption.

Worthington Vertical Compressors are economical to use and reasonable in price.

Paint with Air.



"Paint with air"



Refined Amyl Acetate is the old standby solvent of the lacquer industry—and it is just as good today as ever before. Everyone knows that refined amyl acetate is a blend of amyl with lower boiling acetates. A good grade contains from 70 to 72% amyl. The balance is mostly isobutyl and propyl.

• • •

An extraordinarily good "refined amyl acetate" can be prepared by the lacquer formulator using 60 parts of Pent - acetate (pure amyl acetate) and 40 parts of butyl acetate.

This blend will have the same solvent properties and a better distillation and evaporation rate than a good grade of the usual refined amyl acetate. It will, therefore, show better blush resistance and improved flow, levelling and gloss. If a good grade of butyl acetate is used, this blend will have a milder odor, and be free from any residual odor—an altogether cleaner, sweeter product.

PENTASOL
PURE AMYL ALCOHOL

And, it will show a very substantial saving in cost, an item not to be despised in these times of price competition.

There are a number of ways to use Pentasol and Pent-acetate to improve lacquer and reduce costs by a direct substitution that does not upset the formula. Ask for the Sharples Booklet.

The SHARPLES SOLVENTS *Corp.*
2304 WESTMORELAND ST., PHILADELPHIA
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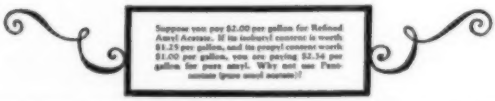
Suppose you pay $2.00 per gallon for Refined Amyl Acetate. If its isobutyl content is worth $1.25 per gallon, and its propyl content worth $1.00 per gallon, you are paying $2.34 per gallon for pure amyl. Why not use Pentacetate (pure amyl acetate)?

First Double Coat Below Belt Moulding

Reduce the material of desired color, fill air brush container or gravity feed bucket and spray a double coat of material, using all necessary precautions.

Operation 25—Aid dry 10 minutes.

Let car body air dry at room temperature for about ten minutes.

Second Double Coat Below Belt Moulding

Spray a second double coat of the material previously used.

Note: In spraying the car body below the belt moulding, it is necessary also to spray the door jambs, edges of coupe and roadster deck lid, side sills, heel boards, etc. In short, every conceivable spot that had been primed and surfaced should be covered up with lacquer.

As usual, let car body air dry at room temperature about ten minutes.

Third Double Coat Below Belt Moulding

This last double coat should be sprayed on as smoothly as possible to get good results and to effect a saving of time in polishing, etc. Air dry about ten minutes.

Removing Mask; Cleaning

The paper covering the car body may now be removed. Any adhesive tape composition left on lacquered surface can be wiped clean with a piece of soft cloth dipped in gas or benzol.

If it be desired to bring car body in one color, the fenders should be masked and the entire body given three coats of properly thinned material, allowing ten minutes air drying between coats.

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Check up your experience, and see if there has been any *one* brand of lacquers and lacquer-enamels you have ever used, which included *all* these essential characteristics and advantages—

Speed in application.

Beauty without equal—so important in selling your products.

Colors in unlimited variety, capable of matching any desired effect.

Grades for every type of application, on every kind of surface and article.

Durability — long life — with correct degrees of adhesiveness, flexibility and hardness.

Economy, with the lowest possible finishing costs.

All these features are manufactured into Zellac. Users of Zellac enjoy all these advantages, providing they are using the correct prescription-compounded grades of Zellac.

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This Polish is highly endorsed by finishing rooms in large plants for the polishing of

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Send for five gallons—Prepaid—
If not as we claim, return it.

Jamestown Wood Finishing Co.
Jamestown, N. Y.

The belt moulding, at this stage, should be finished with either brush lacquer, or sprayed. (Refer to "striping," which will be taken up later.)

From this point on either one of two distinct and clear-cut courses can be followed, namely, the car body may not be polished, or it may be polished.

Next month's article will take up final sanding, the application of the final finishing coat (for luster), polishing, striping, top dressing, etc.

To Obtain Clean Air

Every manufacturing process, in which painting or finishing is necessary, faces certain well defined difficulties. If the spraying method is used, some means must be provided for removing or disposing of the fine spray produced by the system.

In many instances excess spray from either spray booths or spray rooms fills the air and settles on equipment, windows, floors, etc., not only in the rooms where the painting operation takes place, but sometimes in other parts of the plant. If this material is exhausted to the open air, the fine waste spray sometimes settles on nearby buildings and becomes a neighborhood nuisance. In certain types of exhaust systems the fans and exhaust pipes become coated with finishing materials. The cost of keeping this equipment in efficient condition is considerable.

Every finishing room should have ample ventilation, yet the fresh air supplied to replace exhaust air is not always clean. While the freshly-finished articles are drying, dust will settle on the sticky surfaces and in many cases, ruin the finish.

Spray Hose Couplings

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Any size of hose and any size of connection for any make of spray equipment.

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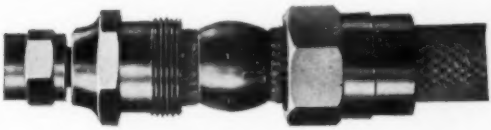

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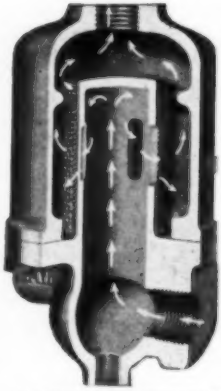

A Gast Separator will be sent you for thirty days free of charge. Just fill out the coupon.

THE Gast Air Separator has no moving parts. There are several thicknesses of brass screen and they form thousands of small baffles. They catch every bit of moisture and oil, which then drops into the dead air space at the bottom.

The Gast—"the separator with a thousand baffles"—supplies the air brush with clean, dry air. When it is installed on an air line there will be no danger of an imperfect finish caused by water and oil getting into the air tools.

Smith-Monroe Company

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Please send me a Gast Compressed Air Separator for a free 30 day trial.

Size (whether for ¾ or 1 inch line).....

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IF7–Gray

It is not an unusual condition to find that finishing rooms are inadequately ventilated for the sole purpose of preventing dust from entering the room. Where forced drying is carried on, the dust problem is usually a serious one due to the large volume of air employed.

Modern type air filters are designed to solve these finishing room problems by catching and holding paint spray and dust before any damage can be done. Equipment of this kind is used in a number of the largest automobile plants.

Placed between the spray booth and the fans and ducts used to exhaust the spray, the filters will allow only clean air to pass, holding the paint and keeping the fans and ducts clean. Efficient air filters, it is claimed, hold absolutely every particle of paint, varnish or lacquer spray. They protect finished products from dust spoilage, by catching and binding all dust before it enters the rooms or equipment where these products are dried.

Certain makes of air filter installations are built up on the unit principle. The basis is the filter unit, which is a self-contained air filter made entirely of metal. Each unit of one particular type consists of a frame about 20-in. square, and a removable cell which is about 3-in. deep.

The design of these filters is such that the waste spray or dust is caught and held throughout the greater part of the depth of the cell. Filter units are assembled according to the space available and capacities required. The only cost involved after proper air filters are installed is that of cleaning the cells and this is carried out in a few minutes' time.

Put Another String In Your Bow!

Now is the time to fortify yourself with another reliable source of supply for your

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All Grades
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"Nitrators since 1898"

When writing for samples please state quantities, grades and viscosities desired.

HANDIGRIP GUN, New or Old, Atomizes Completely

IN seeking high quality finish for fine woods and metals at low cost, the HANDIGRIP self-aligning nozzle-retainer is one of the HANDIGRIP spray gun features which should receive your attention.

Cup Gun

This distinctive HANDIGRIP retainer "laughs at" imperfections of milling or wear of threads. It continues to hold the nozzles in perfect alignment. This insures that, when old as when new, the HANDIGRIP gun gives you the complete atomization from edge to edge of spray which is necessary to secure a flawless finish.

The spray is instantly controlled by an automatic spring valve. The gun is so balanced as to relieve the fatigue of hours of continuous work.

The two-finger trigger doubles the ease of operation. These are other features which give HANDIGRIP quality together with the labor-saving advantages of spray painting.

Pressure Feed Gun

HANDIGRIP handles lacquer, paint, enamel, varnish or wet porcelain. It is easier to clean than a brush. It is used either with a quart cup or with a tank of from two to ten gallons capacity. Guns furnished separately or with complete outfits in small and large sizes.

Plummer-Huff Company positive guaranty provides demonstration in your own work. Write for particulars. Kindly address Dept. F

PLUMMER-HUFF COMPANY
Napoleon, Ohio

In the case of spray filters, cleaning is accomplished by soaking a cell in a solution of paint or varnish remover suited to the material used. In the case of dust, the cell is dipped into hot water, or a hot soda solution. A special washing tank with drain racks attached is supplied by the manufacturer for every installation.

Air compressors are necessarily a part of the spray finishing system, and the effect of dust and dirt on this equipment is not generally appreciated. With every stroke of the piston, any dust and dirt that may be present are pulled into the compressor, along with the air. The amount of dust in all air is not to be judged by whether or not it is visible.

It is claimed that over half the lubricating oil used on any compressor is consumed in simply binding the dust, which at the same time wears both valves and cylinders. There are a number of arrangements of modern air filters, which insure only clean air being supplied to compressors, and which not only greatly reduce compressor shut-downs and repairs, but also save on the amount of lubricating oil required.—W. H. R.

Time for Success

While there can be no set formula or given rule as to how to utilize one's time to the best of advantage—especially to one who wishes to attain success in this world—there can be no doubt that the 24 hours in each day must be so used that each hour will count for something.

If a man desires promotion, he must deserve it. If he desires to earn more money, he must be able

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Lacquer Shading Stains

Finishing products developed by years of concentrated effort to meet the trade's requirements for materials of "UNQUESTIONABLE QUALITY."

DOLAN'S "444" lacquer shading stains are used by well-known concerns in obtaining the delicate highlighting so much in evidence on luxurious pieces of furniture. Are popular for their smoothness in spraying and do not run or bleed.

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to make more profit for his employer.

Employers are always eager to get better and bigger men, but there is a scarcity of valuable men today. With all of our educational systems and technical institutes, there is still a demand for men to fill important positions.

I believe one of the greatest reasons why men, with college educations, or other technical training which fits them for executive positions in the industrial world, fall down on the job given them, is because they do not divide and utilize their time to good advantage.

The greatest mistake and probably the underlying reason why men fail, is the failure to give themselves proper rest and necessary recreation. In this busy, fast-going world, men are apt to keep on going when they should be resting. Prominent nerve specialists and physicians tell us that we are living too fast, that we can not keep up this pace and remain on good terms with Mother Nature.

It is a known fact that business and factory men often overestimate their vitality or strength. It is to these who think they are very strong and can get along on a few hours' rest that there comes a complete breakdown. Too much can not be said on a subject like this, for the writer knows of instances where overwork and too much "on the job" has ruined good men for life, with lost health never to be regained.

After a good rest and plenty of sleep, the average man awakens in the morning ready to give his employer a dollar's worth of work for a dollar's

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AROLAC

It was our ambition for decades to have lacquers and lacquer enamels excel regular paints and varnishes not only in technical advantages and chemical supremacy, but also in dollars and cents. This is now realized in AROLAC Products. By this, we mean, first: the *covering capacity* of AROLAC; and second: the *price* which makes the use of AROLAC an obvious necessity.

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Wood lacquer, Silver and Aluminum lacquer, Bronze lacquer, Brush Brass lacquer and enamels in all colors, glossy and egg shell finishes.

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Where finish is damaged, the quickest and easiest way to permanently repair is with

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STICK SHELLAC

This is melted in the hole, dent or scratch. The damaged place is then rubbed down and polished. The Shellac will not shrink nor check and is extremely tough. It is indeed the easiest, the quickest, the most economical and only permanently satisfactory method to repair serious injury to any finish.

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Get acquainted with the products that will give you 100% better finishings.

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Let us develop an Enamel to suit your particular needs.

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Paint, Varnish and Lacquer Manufacturers
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INDUSTRIAL FINISHING
603 Wulsin Bldg. Indianapolis, Indiana

worth of time, but the man who is constantly out at night, and who thinks he is getting away with just a little sleep—he can not possibly give his employer a square deal. His brains will be sluggish and he will no doubt have that tired feeling.

Allot your body and brains a given numbers of hours' rest and you will find yourself able to grapple with any emergency that may arrive. When you divide up your time properly, you may receive that raise you have been waiting for, or that promotion that you thought was due you.—J. C. Hertstein, Jr.

Cleaner Brush Finishing

Certain finishers who still use brushes for applying varnish are unable to do clean work for reasons which they apparently do not understand. They seem unable to keep their brushes from becoming "lousy," and when a brush gets in that condition one cannot do clean work with it.

One reason why brushes become "lousy" is, that part of the hair is left exposed to the air when the brush is not in use. The brush may be put away in the "keeper," with just enough liquid to cover the hair. In time the volatile oil in the liquid evaporates, leaving the upper end of the hair exposed. Then the varnish, which clings to the exposed hair, hardens sufficiently to crumble when the brush is used again. The fine particles of congealed varnish gradually work down the hair and spread with the fresh varnish over the surface of the work.

Another cause of "lousy" brushes is the use of an unsuit-

The Dependability of

Butanol

"TO err is human"—but in the natural biological process by which Butanol is made from corn, the human element is eliminated in so far as the character and quality of the resulting product are concerned. No tricky or dangerous substances—no insidious film-destroying impurities — can be present even in the crude mixture from which Butanol is distilled.

This inherent advantage of Butanol is particularly important in the manufacture of lacquer, where mysterious failures, due to unproven solvents, may appear months after the lacquer has been applied.

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able liquid in which to keep them soft. Varnish brushes should never be kept in benzine or gasoline. If anyone wishes to know why this is so let him make the following test:

Take a small bottle and partly fill it with varnish; then add an equal quantity of either benzine or gasoline. Hold it up to the light and you will observe that the benzine causes the varnish to lose its amber hue and become a light creamy color. Then the varnish breaks up into minute particles which, for a time, hang suspended in the liquid, but eventually settle to the bottom.

A bit of touching up with the brush is frequently needed even where modern spray equipment is available.

The effect of benzine on the varnish, as one sees it in the bottle, is the same as that which takes place when benzine comes in contact with the varnish in a brush. The varnish breaks up into small particles, and for several days after the brush is again put into service, these particles work their way down the hair and out onto the newly varnished surface.

Another cause of dirty varnishing is the practice of hanging the

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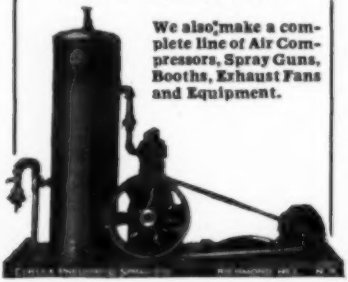

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brush on the side of the varnish cup, when it is not in use. Varnish gathers on the side of the cup and becomes congealed, part of it clinging to the brush when the latter is removed. This congealed varnish breaks up into little particles and spreads over the newly varnished surface.

Where a large varnish cup is used, it should have a crossbar on which the brush may be rested when not in use; but the bar should not touch the hair.

The best liquid in which to keep brushes while they are not in use, is the same kind of liquid they are used with. I have always kept my varnish brushes in a thin varnish solution. I do not believe that even pure turpentine is a good liquid in which to keep varnish brushes. I make a thin varnish solution—2 parts varnish and one part turpentine—and I keep the volume stable by adding fresh turpentine occasionally. Once a month I use this liquid for some kind of rough work, and make up an entirely new supply for the brushes.—V. D. Coxwain.

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CHICAGO

and to obtain the maximum of work in quantity as well as quality, he will have to make a careful study of the workmen individually and handle them accordingly. The most desirable workers are those who are ready and willing to obey instructions, who learn all they possibly can of their work and who do their work thoroughly without becoming easily discouraged by minor drawbacks.

Men who are determined to overcome obstacles and who ask for information when in doubt, will prove to be valuable men and will cause the forman very little trouble or worry. Men of this type will be of assistance in helping newly employed workers to become proficient.

It is the opposite of the above mentioned types of workers that cause the foremen the most trouble and consume most of his time. After giving such men a fair chance and then seeing that they show no improvement, the foreman should weed them out. However, he must be able to place men at work for which they are best suited. A man may be hired to do sanding and he may give his best efforts to it and yet be unable to turn out the desired quality or quantity of work. This man may be transferred to the filling department and prove to be a very efficient workman.

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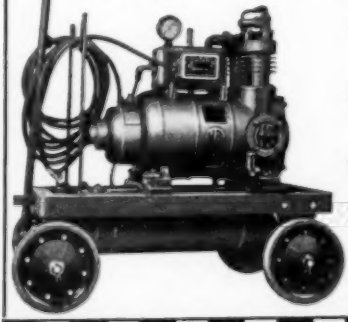

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(69)

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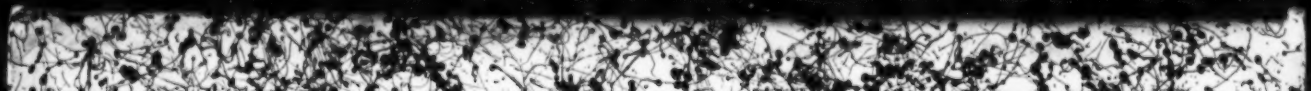
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